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INSTALLATION RESTORATION PROGRAM

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SOUTH DAKOTA AIR NATIONAL GUARD JOE FOSS FIELD, SIOUX FALLS, SD

REMEDIAL INVESTIGATION

APPENDICES VOLUME II FINAL STIECTE FEB 20 1991

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APPENDICES VOLUME II

FINAL

Prepared for:

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APPENDIX E:

CHEMICAL ANALYSES RESULTS

SOUTH DAKOTA AIR NATIONAL GLARD, JOE FOSS FIELD, SIGLE FALLS, SOUTH DAKOTA

	*								,		AMALYSIS PARAMETERS	ARAMETERS				
	ENVIRONMENTAL SAMPLE	DATE	1186	EQUIPMENT	TRIP	FIELD	DUPL I CATE	QQ.	N.G	Md1	FULL MET	As,Pb	100	EP 10X	33	NZO QUAL
S11E 1			; ; ; ;													•
Soit	Soil Boring Samples	æ										:	;	,	>	
	8-1-1-15	4/11	1330	EB-1	18-1	FB-1		×	×	×		×	× :	≺ ;	< ∶	
	8-1-1-25	11/5	1740	EB-1	18-1	FB-1		×	×	×		×	×	× :	* :	
<u>-</u>	8-1-2-15	4/13	0745		18-2	FB-1		×	×	×		×	×	× :	× ;	
	8-1-2-25	4/13	0630	E8-2	2-81	FB-1		×	×	×		×	×	×	×	
3	Samples	le Samole:	ø.													
	Mel. 1.5-15	4/16	9760	EB-6	18-3	FB-1		×	×	×		×	×	×	×	
	MU-1-5-20	6/16	1000	EB-6	18-3	FB-1		×	×	×		×		×		
·	MU-1-6-15	4/16	1455	E8-6	18-3	FB-1	MU-1-6-150UP	×	×	×		×		×		
	1.6.20	4/16	1515	68.6	18-3	FB-1		×	×	×		×	×	×	× ;	
	M-1-7-15	4/17	0855	£8-7	18-3	FB-1		×	×	×		×	×	× :	×	
E	MU-1-7-20	4/17	0915		18-3	FB-1		×	×	×		× :		× >		
-1	M4-1-8-15	4/17	1247	2-83	18-3	FB-1		×	×	× :		> € 2	,	≼ >	>	
	MU-1-8-20	4/17	1300		18-3	FB-1		×	×	×:		× >	<	< ≻	<	
	MU-1-9-15	4/25	0820		7-81	FB-2		×	×	×·		* >	>	€ ≥	×	
	M4:1-9-20	4/25	0160		5-81	FB-2	1	×	× :	× ;		< >	<	: ×	•	
	MU-1-10-15	4/56	0870	EB-9	7-81	FB-2	MJ-1-10-150UP	× :	× :	≼ >		< >	×	: >	×	
	MU-1-10-20	4/56	0936		7-81	FB-2		× :	× ;	<;		: >	:	: ×		
	MJ-1-11-15	4/56	1505		7-81	FB-2		× :	< :	< >		: >	×	×	×	
	MU-1-11-20	4/56	1525	6-83	7-81	FB- 2	- !	×	× :	< >		٠ >	t	: ×		
•	HU-1-12-15	4/27	1535		18-5	FB-2	MJ-1-12-150UP	× :	× :	< >		٠ >	×	: ×	×	
	HU-1-12-20	4/57	1530	EB-10	18-5	FB-2		× :	* 3	< >		· >	ł	: ×		
	HU-1-13-15	4/27	0835	EB-10	18-5	FB-2		× :	× (+)	< >		· >		×		
•	MJ-1-13-20	15/7	0820	EB-10	18-5	fB-2		× ;	× ;	< >		: ×		×		
	NW-1-14-15	4/28	1130	E8-11	18-5	FB-2		× :	≭ :	< >		< >		×		
	MW-1-14-26	4/28	1150	EB-11	18-5	FB-2		×	×	≺		•			•	

TABLE E-1. ENVIRONMENTAL TO GA/GC COMPARISON LIST FOR SOUTH DAKOTA AIR MATIONAL GLARD, JOE FOSS FIELD, SIGUR FALLS, SOUTH DAKOTA (Continued)

FAVIDOMENTA	2140	3 4 1	CONTRACTO	OLOT THE	61619	STATE OF THE				AMALYSIS 6	ANALYSIS PARAMETERS				
SAMPLE					v		XQC	¥#	조	FULL NET	As, Pb	5	EP TOK	233	NZO GUAL
Groundwater Samples		, ,					• • • • •	1 1 1 1 1 1 1 1			•				
First Round															
MU-1-1	4/30			18-7	FB-2		×	×	×		×				×
HU-1-3	4/30			18-7	FB-2		×	×	×		×				×
111-1-4	4/30			18-7	FB-2	MU-1-40UP	×	×	×		×				
MJ-1-5	4/30			18-7	FB-2		×	×	×		×				
MU-1-6	4/30	1238		18-7	FB-2		×	×			×				
FIZ-1-7	4/30			7-81	FB-2		×	×	7		×				
MU-1-8	4/30			18.7	FB-2		×	×	×		×				
MV-1-9	4/30			7-81	FB-2		×	×	×		×				
MU-1-10	4/30			18-7	FB-2		×	×	×		×				
MV-1-11	4/30			18.7	FB-2		×	×	×		×				
	4/30			18.7	F8-2	MJ-1-120UP	×	×	×		×				
E-	4/30			7.81	FB-2		×	×	×		×				
	4/30		EB-12	18-7	FB-2		×	×	×		×				
Second Round															
GE-1-1	7/25	0%0	EB-15	6-81	FB-3		×	×	×		×				
64-1-3	7/25	1435	EB-15	18-9	FB-3		×	×	×		×				
7-1-R5	7/25	1525	EB-15	6-81	FB-3	HW-1-40UP	×	×	×		×				
GU-1-5	7/25	1410	EB-15	18-9	FB-3		×	×	×		×				
64-1-6	7/25	1130	EB-15	18-9	FB-3		×	×	×		×				
Cu-1-7	7/25	1050	EB-15	18-9	FB-3	•	×	×	×		×				
GH-1-8	7/25	1600	E8-15	18-9	FB-3		×	×	×		×				
GH-1-10	2/25	080	EB-15	6-81	FB-3	MJ-1-100UP	×	×	×		×				
GH-1-11	7/25	0855	EB-15	6-81	FB-3		×	3 3	×		×				
GU-1-12	7/25	1635	EB-15	6-81	FB-3		×	×	×		×				
CU-1-13	7/25	1015	EB-15	6-91	FB-3		×	×	×		×				
GU-1-14	7/25	1215	EB-15	6-81	FB-3		×	×	×		×				

TABLE E-1. ENVIRONMENTAL TO GA/QC COMPARISON LIST FOR SOUTH DAKOTA AIR MATIONAL GLARD, JOE FOSS FIELD, SIGLK FALLS, SOUTH DAKOTA (Continued)

										*	CONTINUE CONTINUES	Appropries				
	CULTONMENTAL	DATE	11000	FORTIDMENT	0101	01313	STACE ISSUED				AMALTSIS PAKAMEIEKS	AKAMETEKS				
	SAMPLE	.	<u> </u>	BLAKK		BLANK		AOC	SMA	HQ1	FULL MET	As,Pb	7 <u>0</u>	EP 10X	2	NZO GUAL
S11E 3	•	:	•													
Soil	Soil Boring Samples															•
	83-1-0	4/14	1150		18-3	F8-1		×	×	×	×		×	×	×	
	83-1-5	4/14	1212	E8-4	18-3	FB-1		×	×	×	×			×		
	63-2-0	41/4	1015		18-3	F8-1	83-2-00UP	×	×	×	×			×		
	83-2-5	4/14	1048		18-3	FB-1		×	*	×	×		×	×	×	
	83-3-0	4/14	1337		18-3	FB-1	83-3-00UP	×	×	×	×			×		
	83-3-2.5	4/14	1350		18-3	FB-1		×	×	×	×		×	×	×	
	B3-4-0	4/15	0745		18-3	FB-1		×	×	×	×		×	×	×	
	83-4-5	4,115	0810		18-3	FB-1		×	×	×	×			×		
1	. 83-5-0	4/15	0915		18-3	FB-1		×	×	. ×	×			×		
E-3	83-5-2.5	4/15	0925		18-3	FB-1		×	×	×	×		×	×	×	
ď																
r room	uroundater samptes		1					;	:	;	;					•
	HL-3-1	27	1637		18-8			×	×	×	×					•
	HH-3-2	5/1	1730		18-8		HL-3-20UP	×	×	×	×					
	M4-3-3	2/5	0560		18-8	FB-2		×	×	×	×					
	7-E-M	2/5	1025	EB-14	18-8	FB-2		×	×	×	×					
	HH-3-5	5/1	1520		9-81	FB-2		×	×	×	×					
BACKEROUND							,									
Soil	Soil Boring Samples						-									
•	BK-2-15	4/28	1620			FB-2		×	×	×	×		×	×	×	
	BK-2-20	4/28	1635	E8-11	18-5	FB-2		×	×	×	×		×	×	×	
	BK-2-25	4/28	1650			FB-2		×	×	×	×		×	×	×	
1	BK-3-0.5	4/28	1800			FB-2		×	×	×	×		×	×	×	
	BK-3-5	4/28	1820			FB-2		×	×	×	×		×	×	×	
	BK-3-20	4/28	1850			F8-2		×	×	×	×		×	×	×	

TABLE E-1. ENVIRONMENTAL TO QA/QC COMPARISON LIST FOR SOUTH DAKOTA AIR NATIONAL GLARD, JOE FOSS FIELD, SIGLM FALLS, SOUTH DAKOTA (Continued)

							1				AMALYSIS I	AMALYSIS PARAMETERS				
	ENVIRONMENTAL SAMPLE	DATE	¥	EQUIPMENT BLANK	BLANK	PLANK	DUPLICALE	VOC BALA	BWA	ТРЖ	FULL NET	As, Pb	<u> </u>	EP 10K	CEC	NZO GUAL
QA/QC SAMPLES				0 0 0 0 0 0 0 0	•											-
Trip Blanks	ınks															
	1.81	4/11	1330					×								
	18-2	4/13	0745					×								
	18-3	4/14	1100					×								
	7-81	4/25	0820				\$	×								
	18.5	4/27	0835					×								
	9-81	4/28	1800					×								
	7-81	4/30	9550					×								
	18-8	5/1	1520					×								
	18-9	2/2	0730					×								
Field Blanks	anks															
F	FB-1	61/5	1138					×	×	×	×					
:- 4	FB-2	4/30	0870					×	×	×	×					
.	FB-3	2/12	0740					×	×	×		×				
Equipmen	Equipment Blanks															
•	E8-1	11/5	1330					×	×	×		×				
	E8-3	4/13	0745					×	×	×		×				
	E8-4	4/14	1641					×	×	×	×					
	E8-5	4/15	0745					×	×	×	×	;				
<u></u>	F3-6	4/16	2160					×	×	×		×				
	£8-7	21/5	1045					×	×	× :		K)				
•	E8-3	4/55	0950					×	×	×		< 3				
=	5 -83	4/26	1030		*			×	×	×		× :				
	E5-10	4/27	1200					×	×	×	;	×				
	EB-11	4/28	1700					×	×	×	×	;				
	EB-12	4/30	1945					×	×	×		×				
	EB-13	1/5	1600					×	×	×	×					
	EB-14	2/5	1050					×	×	×	×					
- -	EB-15	7/25	1425					×	×	×		×		•		

TABLE E-2. QUALIFIERS AND ACRONYMS FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Information concerning abbreviations found on data tables can be found here.

- * These samples were collected in January and filtered in the field. The units were reported as mg/L rather than μ g/L; for the sake of consistency, the units were changed to μ g/L. The following detection limits also changed: iron (0.01 mg/L) and manganese (0.001 mg/L). If lead was not detected at the ICP detection limit, then GFAA was used to achieve the lower limit to further analyze the samples.
- ** These samples were collected unfiltered in January. The following detection limits changed: sodium (0.5 mg/L), calcium (0.5 mg/L), and magnesium (0.5 mg/L).
- ND This compound/parameter was not detected at or above the detection level.
- NT This compound/parameter was not analyzed in the respective sampling round.
- (B) Compound was detected in the associated method blank.
- (CC) Continuing calibration verification relative response factor outside control limits.
- (D) Dilution analysis. This flag is associated with the (E) flag.
- (E) The analysis was performed and the concentration exceeds the calibration range of the gas chromatograph/mass spectrometer. If one or more of the TCL's is above the detection level, the sample or extract must be reanalyzed for all of the appropriate TCL's. If dilution causes results from the first analysis to be below the detection level, both analyses would be reported.
- (EB) Compound/parameter was also detected in the associated equipment blank.
- (EH) The extraction holding time was exceeded for the respective sample.
- (FB) Compound/parameter was also detected in the associated field blank.
- (I) The ICP interference check sample percent recovery exceeded the control limits in this instance.
- (H) The CLP holding time was exceeded for this compound/element.
- (IC) The initial calibration verification relative response factor was outside the normal control limits.

TABLE E-2. QUALIFIERS AND ACRONYMS FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

- (J) Estimated value. This flag is used when the mass spectral data indicates the presence of an analyte but the result is below the sample quantitation level.
- (JB) Indicates that the compound/element was detected in the associated method blank but was at a quantitation level below the normal detection level. This is also an estimation of the true result.
- (JX) A combination of (J) and (X), the compound/element in question coeluted but at a level lower than the minimum level of detection.
- (MD) MS/MSD RPD was outside the established control limits for this analyte.
- (RE) Laboratory re-extractions were performed when questionable results need further justification.
- (S) The surrogate recovery was below the minimum control limits.
- (T) The analyte in question was found to coelute from the gas chromatographic column with a similar analyte also noted. The instrument was not able to effectively separate these two constituents and normally reflects a similar, if not equal, level of contamination.
- (TB) Compound or element also detected in the associated trip blank.
- (U) Indicates the compound was analyzed but not detected.
- (X) Same as (T) but was used in a different round of analysis with similar results.
- MWx-y Site x at Monitoring well y (groundwater sample collected in May).
- GWx-y Site x at Monitoring well y (groundwater sample collected in Jan/Jul).
- SW-x Surface water sample collected at Location x.
- MWx-y-z Site x at Monitoring well y and Depth z(feet) (soil sample).
- Bx-y-z Site x at Soil boring y and Depth z(feet) (background soil sample).
- BKx-y Background soil sample.
- FB-x Field blank.
- EB-x Equipment blank.
- TB-x Trip blank.
- QA-x Quality assurance samples.

SITE 1 SOIL BORING DATA SUMMARY FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA TABLE E-3.

			.1989 DATA.			<u>:</u>		.1987 DATA.			19	1989 & 1987 DATA			
Parameters	35	Mean ((1-4)	Range (Min-Max) S (3,4)	No. Samples (3,4)	No. Positives (3,4)	36	Mean (1-4)	Range (Min-Max) (3,4)	No. Samples (3,4)	No. Positives (3,4)	Grand Mean (1-4)	Range (Min-Max) (3,4)	No. Samples (3,4)	No. Positives (3,4)	
PETROLEUM HYDROCARBONS	ຂ	222.80	222.80 (ND-380)	12	5	0.5	65.50	(%-GN)	7	2	144.15	(ND-380)	16	7	•
TOTAL ORGANIC CARBON	0.1	1.26	1.26 (0.8-1.6)	10	10	5	¥	(NT)	0	0	1.26	(0.8-1.6)	5	10	
INORGANICS Arsenic Beryllium Cadmium Chromium Copper Lead Nickel Selenium Zinc	2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00	3.75 NI NI NI NI 2.80 NI NI	(1.1-12.2) (NT) (NT) (NT) (NT) (NT) (NT) (NT) (NT	500005000	500005000	0.5 0.5 0.5 1	2.55 MT MT NT NT NT NT NT NT NT NT NT NT NT NT NT	(1.4-3.1) (NT) (NT) (NT) (NT) (NT) (NT) (NT)	400004000	400004000	3.15 NI NI NI 4.26 NI NI	(1.1-12.2) (NT) (NT) (NT) (CR) (CR) (NT) (NT) (NT)	\$0000 5 000	<u> </u>	
VOLATILE ORGANICS Acetone Ethylbenzene Methylene Chloride Toluene	80000	50.86 920.00 5.11 ND 4125.00	(ND-73) (ND-920) (ND-7) (ND) (ND-8100)	55555	11 - 20 2	ちゃぎだん	28.00 2300.00 NT NT NT AT 6300.00	(ND-28) (ND-2300) (NT) (NT) (ND-6300)	44004	00-	39.43 1610.00 5.11 ND 5212.50	(ND-73) (ND-2300) (ND-7) (ND) (ND)	5555	22 2 3 9	
SEMIVOLATILE ORGANICS Acenaphthene Anthracene Benzo(a) anthracene Benzo(b) fluoranthene Benzo(b) fluoranthene Benzo(c) fluoranthene Benzo(d) fluoranthene Benzo(d) fluoranthene Benzo(d) fluoranthene Benzo(d) fluoranthene Dibenzo(d, h) perylene Dibenzofuran Dibenzofu	e 33 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	132.75 245.00 245.00 257.50 257.50 139.00 189.00 75.50 ND ND ND ND ND ND ND ND ND ND ND ND ND	(ND-162) (ND-330) (ND-315) (ND-315) (ND-310) (ND-180) (ND-180) (ND-430) (ND-87.5) (ND) (ND) (ND) (ND) (ND-220) (ND-197.5) (ND-197.5) (ND-107.5) (ND-107.5) (ND-107.5)	44444444444444444444444444444444444444	00000000000000000000000000000000000000	***************************************			000000000000000000000000000000000000000	000000000000000000000000000000000000000	132.75 245.00 257.50 257.50 139.00 185.00 75.50 ND ND ND ND ND ND 175.00 119.33 170.00 458.67 258.67 885.00 885.00	(ND-162) (ND-315) (ND-315) (ND-315) (ND-310) (ND-112) (ND-120) (ND-60) (ND) (ND) (ND) (ND) (ND) (ND) (ND-1275) (ND-1275) (ND-1275) (ND-1275) (ND-1275) (ND-1275) (ND-1275)		นนกับทบ4นนออออดหพดพอพบ+น	

(1)Units: PETROLEUM HYDROCARBONS, INDRGANICS-mg/kg DB
TOTAL ORGANIC CARBON-% DB
VOLATILE ORGANICS SEMIVOLATILE ORGANICS-ug/kg DB
VOLATILE ORGANICS, SEMIVOLATILE ORGANICS-ug/kg DB
VOLATILE ORGANICS, SEMIVOLATILE ORGANICS-ug/kg DB
(2)Means were calculated using means of re-extractions with first extractions, of duplicates with original samples, and of both where applicable.
(3)If the analyte concentration was greater than 10 times the method blank concentration, the data were included; otherwise, the data were excluded.
(4)ND's were considered a sample but they were not considered in the calculation of the means.

TABLE E-4. SITE I MONITORING WELL DATA SUMMARY FOR SOUTH DAKOTA AIR NATIOWAL GUARD, JOE FOSS FIELD, SIQUX FALLS, SQUTH DAKOTA

2 3.27 (ND-5.9) 2 8.08 (ND-13) 0 NT (NT)
0000000
40004000
(%
14.00 CND-2 14.00 CND-2 14.00 CND-2 14.00 CND-2
rv —
•

(1)LLD is the Lowest Level of Detection given in units of mg/L for Petroleum Hydrocarbons, and ug/L for Inorganics, Volatile Organics, and Semi-Volatile Organics.

(2)Means were calculated by taking the means of re-extractions, duplicates, and different sampling dates and means of all the above where appropriate ND's were not factored in to the calculations of the means.

(3)If the analyte concentration were greater than 10 times the method blank concentration, the data were included; otherwise, the data were excluded (4)ND's were considered a sample but not considered in the calculation of the means.

(5)ND's were considered a sample but not considered in the calculation of the means.

(6)ND's were included; otherwise, the data were excluded the data were excluded the samples.

ND-ND betected

NI-NOT Tested

*Inorganics were filtered on the site in 1989.

SITE 3 SULL BORFED DATA SUMMARY FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, STOUX FALLS, SOUTH DAKOTA TABLE E-5.

			.1989 DATA			:-		.1987 DATA.	• • • • • • • • • • • • • • • • • • • •			1989 & 1987	1987 DATA	
Parameters	36	Mean (1-4)	Range (Max-Nin) (3,4)	No. Samples (3,4)	No. Positives (3,4)	910	Hean (1,2,3a,4)	Range (Max-Min)) (3,4)	No. Samples Po (3,4)	No. ositives (3,4)	Grand Mean (1,2,3a,4	Range (Max-Min)) (3,4)	No. Samples (3,4)	No. Positives (3,4)
PETROLEUM HYDROCARBONS	02	79.19	79.19 (ND-120)	10	æ	02	Q	(ON)	7	0	79.19	(ND-120)	14	80
TOTAL ORGANIC CARBON	0.1	1.52	1.52 (0.4-2.2)	9	•	¥	¥	(NT)	0	0	1.52	(0.4-2.2)	•	•
INORGANICS Arsenic Beryllium Cadmium Chromium Copper Lead Nickel Selenium	0.00 virit	7.73 0.69 0.55 19.75 14.10 11.06 22.90 22.90 70.55	(5.6-10.6) (0.3-1.2) (ND-0.6) (112-29) (10-22) (17-21) (17-31) (ND)	55555555	55%55505	0.5 11 0.5 0.5 10 10 10 10 10 10 10 10 10 10 10 10 10	2.93 NT NT 86.38 3.25 2.25 2.55 2.55 2.55 7.81	(1.4-6.2) (NT) (NT) (S-9) (Z-4-3.2) (12-19) (ND-2.7)	40044444	400444444	5.33 0.69 0.69 13.07 13.08 17.08 17.08 17.08 17.08	(1.4-10.6) (0.3-1.2) (8-0-6) (8-29) (2-22) (2-4-15.1) (12-31) (14-110)	200222222	<u> </u>
VOLATILE ORGANICS Acetone Ethylbenzene Methylene Chloride Toluene	80000	220.00 15816.67 4.25 100.00 19463.25	(ND-220) 7 (ND-36500) 5 (ND-5) 0 (ND-100) 5 (ND-65000)	00000	-M4-4	5 × F F 2	22.67 ND ND ND ND	(ND - 28) (ND) (ND) (ND)	44444	m0000	121.34 151816.67 4.25 100.00 19463.25	(ND-220) (ND-36500) (ND-5) (ND-100) (ND-65000)	24444	, 4M4E4
SEMIVOLATILE ORGANICS Acenaphthene Anthracene Benzo(a) anthracene Benzo(b) fluoranthene Benzo(b) fluoranthene Benzo(c) fluoranthene Benzo(c) fluoranthene Benzo(c) fluoranthene Benzo(c) fluoranthene Bis(2-ethylhexyl) phthalate Chrysene Dibenzo(a, h) anthracene Dibenzo(a, h) anthracene Dibenzo(a, h) anthracene Dibenzo(l, 2, 3, 2, d) pyrene Fluoranthene	e 8333474747333473334747474333 8333474747474747474747474747474747474747	ND 180.00 180.00 180.00 170.00	(ND) (ND-180) (ND-180) (ND-220) (ND-220) (ND-220) (ND-220) (ND-230) (ND) (ND) (ND) (ND) (ND) (ND) (ND) (ND	555555555555555555555	00				000000000000000000000000000000000000000	000000000000000000000000000000000000000	83.00 175.50 175.50 175.50 175.50 175.50 185.00 187.75 187	(ND) (ND-330) (ND-330) (ND-220) (ND-220) (ND-220) (ND-220) (ND-230) (ND-230) (ND-330) (ND-330) (ND-230) (ND-230) (ND-230) (ND-230)	55555555555555555555555	00

(1)Units: PETROLEUM HYDROCARBONS, INORGANICS-mg/kg DB TOTAL ORGANIC CARBON -% DB VOLATILE ORGANICS-ySEMIVOLATILE ORGANICS-ug/kg DB

(2)Means were calculated using means of re-extractions with first extractions, of duplicate samples with original samples, and of both where applicable (3) If the analyte concentration was greater than 10 times the method blank concentration, the data were included; otherwise, the data were excluded. (3a) If the analyte concentration was greater than 5 times the method blank concentration, the data were included; otherwise, the data were excluded. (4)ND's were considered a sample but they were not considered in the calculation of the means.

SITE 3 SURFACE SOIL DATA SUMMARY FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA TABLE E-5.

.....SURFACE SOILS 1989.....

		•																								
	_							 			·														-	
No. Positives (3,4)	4	м	iv iv c	ייי איי	חצו תצו	OIN	0 111	1010	0	o .	- (- (- -	,1,	-	00	, 0	0			-	~	٥,	_ •		
No. Samples (3,4)	2	M	וטינטי	יו או רי	ายกเก	IN IN	יטיטי		'n	iv i	ומו	ט זע	N L	ינטו	n in	יט וי	'n	īV I	A 10	IO I	ın k	'n	N I	W R		ma/ka DR
Range (Max-Min) (3,4)	120)	2.03 (1.7-2.4)	(5.6-10.6) (0.3-1.0)	(12-25) (12-25) (10-18)	7.1-15.1)	(ND) (47.5-87)	(ND) (ND-9850) (ND-4)	(NO) (NO)-11200)	(M)	(ND)	(NO-330)	(ND-220)	(ND-260)	(ND-230)	<u> </u>	(R)	2	CND)	(NO-83)	(ND-180)		(NO-170)	CMD)	(ND)	(003-01)	-SULLANIES-
Mean (M	89.63 (ND-120)	2.03 (1	7.99		10.23 20.60 20.60		N) ON K) 00.0289		S S	_	_		260.00 CR	_		25			85.00 SP GN	_	29	_		200.64	00.00	CAL VIOR
Parameters	PETROLEUM HYDROCARBONS 8	TOTAL ORGANIC CARBON	INORGANICS Arsenic Beryllium	_		5	VOLATILE ORGANICS Ácetons Ethy:benzene 985		SEMIVOLATILE ORGANICS Acenaphthene	Anthracene Renzo(a)anthracene 18		Benzo(g,h,i)perylene 17	afate		Dibenzo(a, h)anthracene	Diethylphthalate Dimethylphthalate	Di-n-butylphthalate	thalate		rene	Z-Methylnaphthalene Z-Wethylnhanol		threne	Phenol 4	7	CINIDITS: PETROLEIM HYDROCARRONS INORGANICS-m

I

(1)Units: PETROLEUM HYDROCARBONS,INORGANICS-mg/kg DB
TOTAL ORGANIC CARBON -% DB
TOTAL ORGANIC CARBON -% DB
" JLATILE ORGANICS,SEMIVOLATILE ORGANICS-ug/kg DB
" JLATILE ORGANICS,SEMIVOLATILE ORGANICS-ug/kg DB
(2)Means were calculated using means of re-extractions with first extractions, of duplicate samples with original samples, and of both where applicable.
(3)If the analyte concentration was greater than 10 limes the method blank concentration, the data were included; otherwise, the data were excluded.
(3a)If the analyte concentration was greater than 5 times the method blank concentration, the data were included; otherwise, the data were excluded.
(4)ND's were considered a sample but they were not considered in the calculation of the means.

TABLE E-7. SITE 3 MONITORING WELL DATA SUMMARY FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

			1989 DATA	(5)	:			1987 DATA			<u>:</u>	.1989 & 1987 DATA(5)	37 DATA(5)	
Parameter	110 (1)	Mean (1-4)	Range (Min-Max) (1)	No. No. Samples Positives (2,3,4) (3,4)	No. sitives (3,4)	E6 C3	Mean ,2,3a,	Range (Min-Max)	No. Samples (4)	No. Positives (3,4)	Grand Mean (1,2,3,4)	Range (Min-Max) (4)	No. Samples (4)	No. Positives (3,4)
PETROLEUM HYDROCARBONS	0.5	8	(ND)	70	0	0.1 **	0.13	(ND-0.2)	7	2	0.13	(NO-0.2)	٥	. 2
INORGANICS Discolved Argenia	u	27 77	(N) 201	u	P	u	8	•	•	•	,	Š	•	•
Dissolved Cadmium	- د	1.00	(ND-1)	'n	2 0	n 🚾	. ×	*(ND-0)	* **	- 0	1.0	(MO-50)	.	4 V
	- -	2.00	(2-2)	'n	150	-	2.00	*(1-4)	• •	7	3.50	(2-7)	•	10
Dissolved Copper	- -	10.00	(5-14)	iv n	יטו	u	3.38	*(2-7)	4.	40	6.69	(2-14)	Φ.	۰,
	- ~	24.10	(14.5-34)	n un	ח גא	۰ ۸	13.00	*(9-18)	4 4	> 4	10.62	(MO-16)	~ ~	n o
Dissolved Selenium Dissolved Zinc	₹ 7 ←	6.73 40.20	(ND-9) (22-53)	in in	410	₽ ←	5.13 15.13	*(ND) *(14-21)	44	04	6.75	(NO-9)	. 0. 0	40
VOLATILE OPGANICS													•	•
Acetone	2	ş	(ND)	'n		25	Q	(QN)	7	0	ş	GR)	0	c
Benzene	,- -,	오 :	(NO	ın ı	0	, .	ş	(NO)	4	0	2	(SE)	. 0.	0
Etnylbenzene Methylene Chloride		2 2	<u> </u>	ın ın	00	- 	2 =	ĈĘ.	4 4	0 0	오 두	2	٥ ٥	00
Toluene Total Xvienes		99	9	. W. K	00	Z -	\	E	4		<u>-</u>	1	. 0. 0	000
	•	È	Cu.	•	>	-	Ę		•	5	2		•	>
SEMIVOLATILE ORGANICS	•	ģ		١	•	!	!	į	•	•			1	
Acenapornene Anthracene	7 ~	<u> </u>		^ Lr		= =		E E	-	0 0	2 5	ê	in v	0
Benzo(a)anthracene	2	2	(SE)	ıv	0	: 	¥	E CE	0	0	유	9	n son	0
Benzo(a)pyrene	.	2 2	Q.S	in i	00	;	¥:	CE.	0	0	오 :	(NO	ın ı	0
Benzo(k)fluoranthene	* ~	2 2	99	ח גח	-	Z	= =		-	-	3 5		U R	-
Bis(2-ethylhexyl)phthalate		9.33	(2-21)	'n	'n	: ' =	¥	E CE	•	00	9.33	(2-21)	חו ר	'n
Chrysene	~ ~	<u> </u>	QQ	.	00	= :	= :	CE	00	00	요 :	8	N.	0
Diethylphthalate	10	<u>운</u>	(SE)	, nun	0	<u> </u>	= =	Ē	-	- C	2		n v) C
2,4-Dimethylphenol	~	ş	(ON)	'n	0	¥	¥	(SE)	0	0	웊	<u>§</u>	'n	0
Di-n-butylphthalate	2	2	(AD)	S.	0	H	Ħ	CMT)	0	0	Š	(A)	in	0
Di-n-octylphthalate	~ r	오 9	Q.	ı, ı	0 0	5 !	= !	CMI	0	0	웃	(M)	SO I	0
Fluorene.	2 0	2 2	(E)	n in	-	= =	=		> C	00	2 5		ın ır	0 0
Indeno(1,2,3-c,d)pyrene	4	2	(Q <u>R</u>)	'n	. 0	=	×	(H)	0	0	2	9	יא ני	•
2-Methylnaphthalene	۰ د	2	(NO	5	0	X.	¥	(MT)	0	0	웆	(MD)	'n	0
Naphinalene Phenanthrene	4 0	2 9	2	v	-	= =	z 5	CIN.	0 0	00	29	QX)	ın ı	0
Pyrene	۰ ۲	€ €	(SE)	ט גט	0	= = =	z z	Ê	0	-	₽ 9	£ 6	n vn	> 0

(1) Units: ug/L (LLD denotes Lowest Level of Detection)

(2) Means were calculated using means of re-extractions with first extractions, of duplicate samples with original samples, and of both where applicable.

(3) If the analyte concentration was greater than 10 times the method blank concentration, the data were included; otherwise, the data were excluded.

(3a) If the analyte concentration was greater than 5 times the method blank concentration, the data were included; otherwise, the data were excluded.

(4) ND's were considered a sample but they were not considered in the calculation of the mean.

(5) 1889 data included; April and July samples.

*Inorganics were filtered on the site in 1987.

**Inorganics were filtered on this is it in 1987.

**NOR Petroleum Hydrocarbon units are mg/L.

Lab Sample Number: 14016-15 Project Sample Number: GW1-4 Lowest Test Level of Results Flag Units Detection 13 mg/L 0.5	0.005 N N N N N N N N N N N N N N N N N N N	ппри при при при при при при при при при
ab Sample Number: 14016-15 roject Sample Number: GW1- est Level o esults flag Units Detecti 13 mg/L 0.5	U mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	1/6n n 1/
	0.005 0.009 NI 38 17 17 13 13 92 700 28 0.2 99 450 450 450	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1
14016-14 er: GW1-3 Lowest Level of Detection 0.5	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	
Lab Sample Number: 14016-14 Project Sample Number: GU1-3 Lowest Level of Results Flag Units Detection 0.5 Umg/L	1 mg/r 1 mg/r	7/6n n n 1/6n n 1/6n n 1/6n n n n n n n n n n n n n n n n n n n
Lab Sampl Project () Test Results 0.5	0.007 0.036 NI IN I	
14016-13 Per: GW1-1 LOWEST LEVEL OF DETECTION 0.5	0.005 0.005 0.5 0.5 0.001 0.2 2 2 2 8 8 8	
Lab Sample Nummber: 14016-13 Project Samplee Number: GW1-1 Lowest Test Level of Results Flag Units Detection 0.5 U mg/L 0.5	U mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	\\\60 \\000 \000 \
Lab Sampl Project S Test Results 0.5	0.005 0.009 N. 27 27 27 7.3 7.3 120 9.0 8.6 140 14 11 11 11 11 11 11 11 11 11 11 11 11	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data January 1989 PETROLEUM HYDROCARBONS	INORGANICS Arsenic Lead(by ICP) Lead(by ICP) Lead(by fraphite Furnace) Magnesiun Sodium Calcium Manganese Iron Total Suspended Solids Iotal Dissolved Solids Chloride Nitrate Sulfate Total Alkalinity Bicarbonate Alkakinity PH	VOLATILE ORGANICS Chloromethane Bromomethane Vinyl Chloride Chloroethane Wathylene Chloride Chloroethane The Dichloroethane The Dichloroethane Trans-1,2-Dichloroethane Carbon Disulfide Trans-1,2-Dichloroethane Carbon Terrachloroethane The Trichloroethane The Trichloroethane The Trichloroethane The Carbon Tetrachloride Vinyl Acetate Bromodichloromethane The Carbon Tetrachloride Vinyl Acetate Bromodichloromethane The Carbon Tetrachloroethane

SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22	Lab Sampl Project S	Lab Sample Nummber: 14016-13 Project Samplee Number: GW1-	14016-13 er: GW1-1	Lab Samp Project	Lab Sample Number: 14016-14 Project Sample Number: GW1-3	14016-14 er: GW1-3	Lab Samp Project	Lab Sample Number: 14016-15 Project Sample Number: GW1-	14016-15 er: GW1-4
Lab Analysis by Laucks Testing Labs	Toot		Lowest Level of	Toct		Lowest Level of	Test		Level of
Ki Data January 1909	Results	Flag Units	Detection	Results	flag Units	Detect	Results	Flag Units	Detect
SEMIVOLATILES	(Re-e	e-extraction)	ſ	ſ		r	, (Re-	(Re-extraction)	
Phenol	v c	U ug/L	۰£	٠ <u>٠</u>	7/60 0	, F	, Ç	1,671	
Ani(ine Dis/2-chlosoethyl)ether	۰,	1 00/L	2 ~	2		2	2		اد ا
2-Chlorochenol	۱~		7	~		2	2		2
1,3-Dichlorobenzene	~	U ug/L	~	۸ د		~	~ ~	U ug/L	, N C
1,4-Dichlorobenzene	N (7/6n n	v c	νn	7/6/1	<i>y</i>	<i>3</i> ~	U 49/L	۸ ۷
Benzyl Alcohot	vn	1 10/1	<i>,</i> v	10	-	2	10		1 74
2. Vicinal occursion	i (\	7/65 n	۱ ۸	ام ا	1/6n n	~	2		2
Bis(2-chloroisopropyl)ether	1 ~	J/Sn n	~	7		8	2		7
4-Methylphenol	~	U ug/L	2	2	U ug/L	7	~		~
N-Nitroso-di-n-propylamine	۷.	U ug/L	~∙	α.		2,	2,		~ ~
Hexachloroethane	4 (4 (4 (4 (4 (0 ug/L	\$ 0
Nitrobenzene	7 0	7/6n n	v 0	u 0	1/6/1	u	۸ ۷	0 09/L	1 0
Sopnorone 2-Nitrophesol	u • u	1/60 1	1 4	14	7/60 O	14	14	0 ug/L	7
2 4-Dimethylphenol	۰ ۵		۰ ۸	ν.		7	75	ng/L	2
Benzoic Acid	25		25	20		20	23		27
Bis(2-chloroethoxy)methane	2		~	۰ ۲	n ug/L	ν,	2	1/6n n	~ ~
2,4-Dichlorophenol	41		40	4 0	7 m	1 (4 V	U U9/L	1 (v
1,2,4 "Ichlorobenzene	V <	7/60 0	u v	٦ <u>۲</u>		1 4	14		14
Naphther the A-th occasiline	۰ ۲		۰ ۸	2 2	7/6n n	'n	~ ~		~:
Hexachlorobutadiene	۰ ۱	T/Sn n	1 74	8	n ug/L	~	2		~
4-Chloro-3-methylphenol	4		4	4	U ug/L	7 (4 (7, en u	4 (
2-Methylnaphthalene	~		۰ ۲۵	α,		~ 10	Ν,		V ~
Hexachlorocyclopentadiene	4 •		4、	4 4	U U9/L	4 4	1 4	U UG/L	t 4
2,4,6-Trichlorophenol	\$ <	7 60 C	t <	† V		1 4	1 4		• 4
2,4,3-1richlorophenol 2-rhloroparhthalene	‡ (V	0 ug/L	r (V	۲۸		· N	۰ %		2
2-Nitroanaline	1 4		4	4	U ug/L	4	7		7 (
Dimethylphthalate	8		7	~	n ug/L	~	~		74.0
Acenaphthylene	~		~	٧,	1/6n n	V ~	V V	7/6/1	4 7
2,6-Dinitrotoluene	1 5	1 ug/L	, 5	, <u>C</u>	1,00/1	10,	10		10
5-Nitroanatine	2 ∼	1/60 6	2 ~	~	1/6n	2	7		2
2.4-Dinitrophenol			21	50	1/6n N	20	20	U ug/L	200
4-Nitrophenou	21		2	8	U ug/L	50	50		ર જ
Dibenzofuran	~		η,	4 -	ng/L	٧.	٧.	1/5n n	v ~
2,4-Dinitrotoluene	4 (U ug/L	4 (ŧſ	0 ug/r	10	, t	1/6n 0	۰ ۲
Diethy(phthalate	<i>\</i>	7/50 0	<i>u</i>	40		10	۰ د		~
Fluorene	: ~		۰ ۵	∞.		2	2		~
4-Nitroaniline	7		4	4		7 (4 (U ug/L	4 6
4,6-Dinitro-2-methylphenol	23		5.	₹,	1/6n 0	2	3,	U UG/L	2 6
N-Nitrosodiphenylamine	v <	760 0	u 4	1 1		14	14		7
1,2-Uiphenyinyarazine 7-Bromohopyl showlether	1 4		14	• •		7	4		7
Hexachlorobenzene	~ ~		. 2	~ ~		2	7		~ 6
Pentachlorophenot	21			50	. 1/6n n	ສຸດ	2		₹,
Phenanthrene	~ (~ r	۵,	1/6n	vn	v ~	7/6n n	۰~
Anthracene Signaturi State 1 2 2 2	<i>,</i> ,	U UG/L	u n	o ~	1/6n	10	۰ د		2
or matching are Fluoranthene	10		۰.	5		~	ທ	ng/L	~ (
Pyrene	2	U ug/L	~	2 5		~ 5	ဆပ်		٠. د
Benzidine	25	_	52) (1/6n n	2	<u> </u>	7/6n n	. ~
Butylbenzylphthalate	, 5	0 ug/L	٦,	5 0	7/50 0	20,	<u>5</u> 0		8
5,5'-Dichtoropenziume]	1 1 2	i	1		í		ı	

SAIC IRP Project - Joe Foss Field	Lab Sample	Lab Sample Nummber: 14016-13	4016-13	Lab Samp	Lab Sample Number: 14016-14	4016-14	Lab Samp	le Number:	14016-15
SAIC Project No. 01-827-03-769-22	Project Sa	Project Samplee Number: GW1-1	r: GW1-1	Project	Sample Numbe	r: GW1-3	Project	Project Sample Number: GW1-4	er: GW1-4
Lab Analysis by Laucks Testing Labs			Lowest			Lowest			LOWEST
RI Data January 1989	Test	_	Level of	Test		Level of	Test		Level of
	Results	Flag Units Detection	Detection	Resul ts	Flag Units Detection	Detection	Results	Flag Units	lag Units Detection
Benzo(a)anthracene	2	U ug/L	7	Ŋ	ng/r	7	7	U ug/L	~
Chrysene	7	U ug/L	7	S	ug/L	~	C)	U ug/L	~
Bis(2-ethylhexyl)phthalate	7	ug/L	7	5	ng/r	7	7	1/6n	~
Di-n-octyl-atholate	2	U ug/L	2	~	1/8n U	2	7	1/6n n	~
Benzo(5, tuoranthene	4	U ug/L	4	Ŋ	T ug/L	4	7	U ug/L	4
Benzo(k)fluorantinene	7	U ug/L	4	Ŋ	T ug/L	4	4	U ug/L	4
Benzo(a)pyrene	7	U ug/L	4	4	U ug/L	4	7	U ug/L	4
Indeno(1,2,3-c,d)pyrene	7	U ug/L	4	4	U ug/L	7	7	7/6n n	7
Dibenzo(a,h)anthracene	4	U ug/L	4	4	U ug/L	4	7	U ug/L	4
Benzo(a.h.i)bervlene	7	U UG/L	4	7	U UG/L	7	7	U uq/L	4

1	Analysis by Laucks Testing Lab						LOWCOL	
0.005 U mg/L 0.005	anuary 1989 HYDROCARBONS		flag Units U mg/L	Level of Detection 0.5		flag Units U mg/L		
NY NY D mg/L NY	S	0.005		0.005	0.005		0.005	
N N N N N N N N N N	raphite Furnace)	0.00		9.00	0.001		0.00	
NI U mg/L NI NI U mg/L NI		z z		žŻ	<u> </u>		žŹ	
N		IX.		×	물		¥	
		ž		Z Z	= =		<u> </u>	
NI U mg/L NI NI U mg/L NI NI U mg/L NI NI U mg/L NI NI NI U mg/L NI NI NI U mg/L NI		N.		Z	=		N.	
NIT U mg/L NIT NIT NIT U mg/L NIT NIT NIT U mg/L NIT		Z		¥	TN		X.	
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bane 3 0 ug/L 3 3 3 0 ug/L 1 1 1 0 ug/L 1 1 1 0 ug/L 1 1 1 0 ug/L 1 1 0 ug/L 1 1 0 ug/L 1 1 1 0 ug/L 1 1 0	:	 ≀		 ≀	•-·		 ,-	
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Chloroethane 5 U ug/L 5 5 U ug/L 1 1 U ug/L 1 1 U ug/L 1 1 U ug/L 3 3 U ug/L 3 3 U ug/L 1 1 U ug/L 3 3 U ug/L 1 1 U ug/L 1 1 U ug/L 1 1 U ug/L 1 1 U ug/L	;	M I		W I	M I		M 14	
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orop:opene 3 0 09/L 3 3 0 0 00/L 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ne L	- 1		r- jv	p-		- ~	
U U U U U U U U U U U U U U U U U U U	cntoropropene			n -	ე ←	1/80 0 0	1	
	nes	_	U ug/L			1/6n n	_	

SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22	Lab Samp Project	Lab Sample Number: 14016-11 Project Sample Number: GA-1	Lab Samp Project	Lab Sample Number: 14016-12 Project Sample Number: 0A-2	14016-12 er: 0A-2	
Lab Analysis by Laucks Testing Labs	Toet	Lowest	Test		Level of	
<u>-</u>	Results			flag Units	Detect	
SEMIVOLATILES	·	2 1/0/11	^	11 11971	2	
Prenot	75		, 2		10	
Bis(2-chloroethyl)ether	2		~		~ (
2-chlorophenol	~ (~ ~	0 ug/L	<i>7</i>	
1,3-Dichlorobenzene	٧N	U U9/L 2	4 0	7/60 n	۰,	
Renzyl Alcohol	۰ د		~		2	
1,2-Dichlorobenzene	~	ng/L	~		~ 1	
2-Hethylphenol	∾ (ug/L	~ ~	1/60 n	70	
Bis(2-chlororsopropyl)ether	u 0	1 10/L 2		0 mg/L	ام د	
4-Retnytphenot N-Nitroso-di-n-propytamine	۰ ۲		10		· N	
Hexachloroethane	4	ug/L	7 (4 (
Nitrobenzene	~ .		70	7/60 0	70	
[Sophorone	V 4	7 ng/L 7	1 4		14	
2.4-Dimethylphenol	۰2	ng/L	∾;		~ ?	
Benzoic Acid	8		20		3,5	
Bis(2-chloroethoxy)methane	~ ~	7 7/6n 0	V V	1 to 0/L	J 4	
1 2 4-Dichtoropensene	۰ م	7/5n	. ~		~	
Naphthalene	7		7		7 (
4-Chtoroaniline	~ (U ug/L 2	01	1/6n n	~ ~	
Hexachlorobutadiene	V <	2 n dg/L 2	V 4	2/60 51	1 4	
4-Unioro-S-metnyipaenoi 2-Methylpaphthalene	۰ ۸		. 2		~~	
Hexachlorocyclopentadiene	1 ~		4		4	
	4		4.		4、	
2,4,5-Trichlorophenol	4 (3 0	7/60 0	2 V	
2-Chloronaphthalene	V V	7 7/60 0	. 4		1 3	
Dimethylchthalate	~		2		~	
Acenaphthylene	~		~		~ ~	
2,6-Dinitrotoluene	7		1 -	1 09/L	, =	
3-Nitroanaline	2 ~	U U9/L 10	2 ~		2	
2.4-Dinitrophenol	. 8	ng/L	50		ន	
4-Nitrophenol	2		20 20 20 20 20 20 20 20 20 20 20 20 20		≅.	
Dibenzofuran	~	7 1/6n n	V V	7/80 0	u 4	
C.4-DINITrotoluene	* ~		. 7		~ ~	
4-Chlorophenyl phenylether	۰ د	ng/L	2		~ (
Fluorene	~		2 .		V ~	
4-Nitroaniline	√ 6		1 6	1 10/1	50 50	
4,6-Dinitro-2-methy[phenol	3 ~	U9/L	2 6		3 2	
N-Nitroscolphenylamine 1.2-Diphenylhydrazine	14	ug/L	14		7	
4-Bromophenyi phenylether	٠,5	ng/L	4 (4 (
Hexachtorobenzene	~ 8	U ug/L. 2	٧٢	7/60 C	202	
Pentachlorophenol	3 ~	ng/L	2 2		2	
Anthracene	۰,	1/6n	2		2	
Di-n-butylphthalate	~ ~		~ ~	1/6n	~ ~	
Fluoranthene	7 0	U U9/L 2	• ~		10	
Pyrene Repzidine	3.02		20		20	
Butylbenzylphthalate	~		~ 6	U ug/L	~ 8	
3,3'-Dichlorobenzidine	20	0.7 1/6n N	3	7/60 O	3	

SAIC IRP Project - Joe Foss Field	Lab Samp	Lab Sample Number: 14016-11	Lab Samo	Lab Sample Number: 140%-12	4050-12
SAIC Project No. 01-827-03-769-22	Project	Project Sample Number: QA-1	Project :	Project Sample Number: 3A-2	7- 3A-2
Lab Analysis by Laucks Testing Labs		Lowest			Lovest
RI Data January 1989	Test	Level of	Test		Level of
	Results	Flag Units Detection	Results	Flag Units Detection	Detection
Benzo(a)anthracene	~	U ug/L 2	2	U ug/L	7
Chrysene	2	U ug/L 2	~	U UQ/L	~
8 is (2-ethylhexyl) phthalate	ю	ug/L 2	2	1/5n n	~
Di-n-octylphthalate	2	U ug/L 2	7	U UQ/L	7
Benzo(b) fluoranthene	4	U ug/L 4	7	U uq/L	7
Benzo(k) fluoranthene	4	U ug/L 4	7	T/bn n	7
Benzo(a)pyrene	4	7, ug/L	4	n nd/L	7
Indeno(1,2,3-c,d)pyrene	4	7 ng/L 4	7	U ug/L	4
Dibenzo(a,h)anthracene	4	U ug/L 4	4	1/6n n	4
Benzo(g,h,i)perylene	4	n ng/L 4	4	U ug/L	4

SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-789-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		TOXICITY METALS Arsenic Selenium Mercury Silver Cadmium Lead Chromium Barium	TOXICITY PESTICIDE/HERBICIDE COMPOUNDS Garma-BHC (Lindane) Endrin Methoxychlor Toxaphene 2,4-D 2,4,5,-TP	INORGANICS Antimory Thatium Lead Arsenic Selenium Mercury Silver Copper Beryllium Nichel Cadmium Chromium	TPH OIL & GREASE	TOTAL ORGANIC CARBON	VOLATILE ORGANICS (BY GC/MS) Chloromethane Bromcomethane Vinyl Chloride Chloroethane Methylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethane 1,1-Dichloroethane
Sa Ka	lest Result Flag	0.00.0 0.00.0 0.00.0 0.00.0 0.00.0 0.00.0	0.05 0.10 0.5 0.5 0.5 0.5	TITOTA MARKATANA PORTA P	20 U m	7.0	000F08000, 22222222
	Unit	7/8m 7/8m 7/8m 1/8m 1/8m 1/8m 1/8m 1/8m 1/8m 1/8m	7/8n 7/8n 7/8n 7/8n 7/8n 1/8n	mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB	mg/kg DB	% DB	ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB
B1-1-15 15928-76 SOIL EB-1, TB-1, FB-1	ררס	0.02 0.002 0.01 0.01 0.1	0.05 0.1 0.5 1 0.5	4000000 0 0 444444444444444444444444444	20	0.1	444 <u>F</u> 46444
Sample No. Lab Sample No Matrix Assoc Sample()	rest Result	0.2 0.002 0.01 0.01 0.11	0.05 0.15 0.55 0.55	**************************************	20	1.1	4.8
e No :	Flag Uni	7/6m 1/6m 1/6m 1/6m 1/6m 1/6m 1/6m 1/6m 1	7/6n n 7/6n n 7/6n n 7/6n n 7/6n n 1/6n n	### ##################################	U mg/kg DB	×	0 63/kg 0 63/kg 0 63/kg 0 63/kg 0 63/kg 0 63/kg 0 63/kg
81-1-25 15928-77 SOIL EB-1, TB-1, FB-1	it LLD	0.002 0.002 0.01 0.01 0.1	0.05 0.15 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	88 88 88 88 88 88 88 88 88 88 88 88 88	1 08 20	0.1	08 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
Sample No. Lab Sample No Matrix Assoc Sample(s)	Result F	0.00 0.00 0.01 0.01 0.01	0.00 0.5.00 1.5.00 1.5.00	7.7.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2	21	6.0	252 252 253 254 257 257 257 257
#o ::	Flag Unit	7/6w n 7/6w n 7/6w n 7/6w n 7/6w n 7/6w n 7/6w n 7/6w n	7/80	72/kg D8 72/kg D8	mg/kg 08	80 *	0 ug/kg DB 0 ug/kg DB 0 ug/kg DB 0 ug/kg DB 0 ug/kg DB 0 ug/kg DB 0 ug/kg DB
81-2-15 15928-78 501L EB-2 TB-2 FB-1	ררס	0.02 0.002 0.01 0.01 0.1	0.05 0.10 0.5 0.5	00000000000000000000000000000000000000	50	0.1	170 170 170 170 170 170 170
Sample No. Lab Sample No Matrix Assoc Sample()	lest Result F	0.2 0.602 0.102 0.01 0.01 0.1	0.05 0.11 0.5 1 1	######################################	37	.:	571 500 500 500 500 500 500 500 500 500 50
	flag Unit	7/6w n 7/6w n 7/6w n 7/6w n 7/6w n 7/6w n 7/6w n 7/6w n	7/5n n 1/5n n 1/5n n 1/5n n 1/5n n 1/5n n	mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB	mg/kg DB	X 08	U ug/kg DB U ug/kg DB
81-2-25 15928-79 SOIL EB-2 TB-2 FB-1	9	0.2 0.002 0.011 0.011 0.110	0.05 0.1 0.5 0.5	%0000000000000000000000000000000000000		0.1	271 200 200 200 200 200 200 200 200 200 20

Sample No. : B1-2-25 Lab Sample No : 15928-79 Matrix : 501L Assoc Sample() : EB-2 TB-2 FB-1	900 ug/kg DB 78 78 U ug/kg DB 78 39 U ug/kg DB 78 200 U ug/kg DB 78 200 U ug/kg DB 78 39 U ug/kg DB 78
Sample No. : 81-2-15 Lab Sample No : 15928-78 Matrix : 501L Assoc Sample(s) : EB-2 TB-2 FB-1 Result Flag Unit LLD	600 ug/kg DB 79 79 U ug/kg DB 79 79 U ug/kg DB 79 79 U ug/kg DB 79 70 U ug/kg DB 70 71 J ug/kg DB 70
Sample No. : 81-1-25 Lab Sample No : 15928-77 Matrix : 501L Assoc Sample() : EB-1, Test Result Flag Unit LLD	62
Sample No. : 81-1-15 Lab Sample No : 15928-76 Matrix : 501L Assoc Sample() : E8-1, 18-1, 18-1 Test Result Flag Unit LLD	260 ug/kg DB 38 76 U ug/kg DB 76 76 U ug/kg DB 76 38 U ug/kg DB 76 38 U ug/kg DB 76 190 U ug/kg DB 38 38 U ug/kg DB 38 190 U ug/kg DB 38 1
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	2-Methylnapthalene hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloromapthalene 2-Mitroaniline Dimethylphthalate Acenaphthene 2,6-Dinitrophenol 3-Mitroaniline Acenaphthene 2,4-Dinitrophenol bienylphthalate 2,4-Dinitrophenol bienylphthalate 2,4-Dinitrophenol biethylphthalate 2,4-Dinitrophenol biethylphthalate 4,6-Dinitro-2-Methylphenol N-Nitroaniline 4,6-Dinitro-2-Methylphenol N-Nitroaniline 4,6-Dinitro-2-Methylphenol N-Nitroaniline 6,-Nitroaniline 7,6-Dinitro-2-Methylphenol N-Nitrosodiphenyl-phenylether Hexachloropenzene Pentachlorophenol Phenanthrene Din-burylphthalate Birylphenzylphthalate S,3-Dichlorobenzidine Burylbenzylphthalate Birylphenzylphthalate Birylce Birylphenzylphthalate

(1) Cannot be separated from: Diphenylamine

SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		EP TOXICITY METALS Arsenic Selenium Mercury Silver Cadmium Lead Chromium Barium	EP TOXICITY PESTICIDE/HERBICIDE COMPOUNDS Garma-BHC (Lindane) Endrin Hethoxychlor Toxaphene EX 2,4-0 CX 2,4,5,-TP	INORGANICS Antimony Thallium Lead Arsenic Selenium Mercury Silver Copper Beryllium Nickel Cadmium Chromium	TPH OIL & GREASE	TOTAL ORGANIC CARBON	VOLATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene
Sample No. : Lab Sample No : Matrix : Assoc Sample() :	Test Result Flag Unit	0.2 U mg/L 0.02 U mg/L 0.002 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L	POUNDS 0 ug/L 0.10 ug/L 0.5 U ug/L 0.5 U ug/L 1 U ug/L 1 U ug/L 1 U ug/L 1 U ug/L 0.5 U ug/L 0.5 U ug/L	NT mg/kg DB NT mg/kg DB 3.0 mg/kg DB 1.2 mg/kg DB NT m	20 u mg/kg DB	1.6 % DB	2 U ug/kg DB 2 U ug/kg DB 2 U ug/kg DB 5 U ug/kg DB 42 ug/kg DB 2 U ug/kg DB 2 U ug/kg DB 2 U ug/kg DB 2 U ug/kg DB 3 U ug/kg DB 2 U ug/kg DB 3 U ug/kg DB 3 U ug/kg DB
MV1-5-15 15928-92 SOIL EB-6, TB-3, FB-1	ררס	0.02 0.002 0.01 0.01 0.11 0.11	0.05 0.1 0.5 1	08 2.5 08 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	8 20	0.1	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Sample No. Lab Sample No : Matrix : Assoc Sample() :	Test Result Flag Unit	0.2 U mg/L 0.2 U mg/L 0.002 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L	0.05 U ug/L 0.1 U ug/L 0.5 U ug/L 1 U ug/L 1 U ug/L 0.5 U ug/L	NT mg/kg NT ng/kg 2.6 mg/kg 1.3 mg/kg NT mg/kg	20 U mg/kg DB	NT % DB	2 U ug/kg 2 U ug/kg 2 U ug/kg 6 U ug/kg 6 U ug/kg 62 U ug/kg 2 U ug/kg 2 U ug/kg 2 U ug/kg 2 U ug/kg 2 U ug/kg
MV1-5-20 15928-93 SOIL EB-6, TB-3, FB-1		0.02 0.002 0.01 0.01	0.05 0.1 0.5 1	088 0.5 08 0.5 08 0.5 08 0.1 08 0.1 08 0.1 08 0.5	08 20	3 0.1	008 008 008 008 008 008 008 008 008 008
Sample No. Lab Sample No Matrix Assoc Sample(s)	Test Result Flag U	0.2 U mg/L 0.2 U mg/L 0.02 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L	0.05 U ug/L 0.1 U ug/L 0.5 U ug/L 1 U ug/L 1 U ug/L 0.5 U ug/L	NI mg/kg NI mg/kg 2.8 mg/kg 4.8 mg/kg NI mg/kg	20 U mg/l	TN X	2 U ug/kg 2 U ug/kg 2 U ug/kg 6 U ug/kg 71 ug/kg 71 ug/kg 2 U ug/kg 2 U ug/kg 2 U ug/kg
: M41-6-15 : 15928-94 : SOIL : EB-6, TB-3,	.c. Unit LLD	0.02 0.02 0.01 1.1 1.1 1.1 1.1 1.1 1.1	1 0.05 1 0.1 1 0.5 1 1	Kg DB 2.5 Kg DB 0.5 Kg DB 0.5 Kg DB 0.5 Kg DB 0.1 Kg DB 0.1 Kg DB 0.1 Kg DB 0.1 Kg DB 0.1 Kg DB 0.1 Kg DB 0.5 Kg DB 0.5	mg/kg D8 20	0.1	(49 DB (49 DB (40 DB (4
Sample No. Lab Sample No : Matrix Assoc Sample() :	Test Result Flag Unit	0.2 U mg/L 0.2 U mg/L 0.002 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L	0.05 U ug/L 0.11 U ug/L 0.5 U ug/L 1 U ug/L 1 U ug/L 0.5 U ug/L	NT mg/kg N1 mg/kg 3.2 mg/kg 7.0 mg/kg N1 mg/kg N1 mg/kg N1 mg/kg N1 mg/kg N1 mg/kg	20 U mg/kg DB	NT % DB	2 U ug/kg 2 U ug/kg 2 U ug/kg 5 U ug/kg 61 ug/kg 61 ug/kg 2 U ug/kg 2 U ug/kg 2 U ug/kg
MW1-6-15D 15928-95 501L EB-6, 18-3,		0.02 0.02 0.01 0.01	0.05 0.1 0.5 1	DB 2.5 DB 0.5 DB 0.5 DB 0.5 DB 0.1 DB 0.1 DB 0.1 DB 0.5 DB 0.5 DB 0.5 DB 0.5	DB 20	0.1	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

MM1-0-150 15928-95 3501L EB-6, FB-1 LLD	000000000000000000000000000000000000000	04444444444444444444444444444444444444
unit unit	60, kg 0 B	19 (18) (18) (18) (18) (18) (18) (18) (18)
Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
55.7	<i>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</i>	
: : : : : : : :	ug/kg 08 ug/kg 08	ug/kg DB ug/kg DB
Jampie No Matrix Assoc Sample(s) Test Result Flag	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	18818183818818888888888888888888888888
15928-93 501L EB-6, TB-3, FB-1	nnonnnnononnononnnnnn	***********************
unit	68/kg 08 68/kg 08 68/	69/63 DB CB/63 DB CB/
Sample No. Lab Sample No. Matrix Assoc Sample() Test Result Flag	CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	
MM-5-15 15928-92 15928-92 1501 18-3, 18-3, 18-1	NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN	333333333333323228383838383838383838383
: : : : : Unit	Ug/kg DB Ug/kg DB	ug/kg DB ug/kg DB
Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Chloroform 1,2-Dichloroethane 2-Butanone 1,1,1-Trichloroethane Carbon Tetrachloride Vinyl Acetate Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropene Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane Benzene 1,1,2-Trichloroethane Bromoform 4-Methyl-2-Pentanone 2-Hexanone 1,1,2,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane Chlorobenzene Chlorobenzene Ethylbenzene Ethylbenzene Styrene	Phenol Bis(2-chloroethy()ether 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 2-Methylphenol Bis(2-chloroisopropyl)ether 4-Methylphenol N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene 2-Nitrophenol 2,4-Dinchylphenol 8 sig(2-chloroethane 1 sophorone 2-Nitrophenol 2,4-Dinchylphenol 8 sig(2-chloroethane 1 2,4-Tirchlorobenzene 2,4-Dinchorophenol 8 sig(2-chloroethane 1,2,4-Trichlorobenzene 1,2,4-Trichlorobenzene Napthalene 4-Chloroeniline Napthalene 1-2,4-Dichorophenol 8 sig(2-chloroethane)
SAIC IRP SAIC Pro Lab Anal RI Data	Chlorofore 1,2-Butanon 1,1,1-Trii 2-Butanon 1,1,1-Trii Carbon Tel Vinyl Ace Broadichloro 1,2-Dickloro Dibroacchloro Dibroacchloro Cis-1,3-D Trickloro Dibroacchloro Cis-1,2-Trii Benzene trans-1,3-Broadoform 6-Heathyl-2-Hexanon 1,1,2-Trii 2-Hexanon 1,1,2,2-Trii Coluene Chloroben 5-Buthenz 5-Buthen	SEMI-VOLA Phenola Bis(2- Bis(2- Chlo 1,4-Dil 1,2-Dil 1

MW1-6-150 15928-95 15928-95 15921 18-6 18-3, 18-1	
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MW1-6-15 15928-94 SOIL EB-6, FB-1 FB-1	22222228888888888888888888888888888888
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Sample No. Lab Sample No Matrix Assoc Sample(s: Test Result Flag	222222888888888822882288228822822228
M41-5-20 15928-93 SOIL EB-6, TB-3, FB-1	22 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
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MU1-5-15 15928-92 SOIL EB-6, TB-3, FB-1	388838388388388388838888888888888888888
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SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs PRI Data April-May 1989	2-Methylnapthalene Hexachlorocyclopentadiene 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronapthalene 2-Nitroaniline Dimethylphthalate Acenaphthene 2,6-Dinitropluene 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol Dibenzofuran 2,4-Dinitrophenol Chlorophenol Dibenzofuran 2,4-Dinitrophenol Chlorophenyl-phenylether fluorene 4-Chlorophenyl-phenylether fluorene 4-Ginitro2-Methylphenol N-Nitroaniline 4,6-Dinitro2-Methylphenol Phenanthrene Pentachlorophenol Phenanthrene Pentachlorophenol Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Butylbenzylphthalate Fluoranthene Butylbenzylphthalate Di-n-butylphthalate Di-n-ctyl phthalate Benzo(a)anthracene Chrysene Benzo(a)anthracene Chrysene Benzo(b)flouranthene Benzo(b)flouranthene Benzo(b)flouranthene Benzo(c)a)pyrene Dibenzo(a, h)anthracene Benzo(a, h)anthracene

(1) Cannot be separated from Diphenylamine

MU1-8-15 15928-99 SOIL EB-7, TB-3, FB-1,	0.002 0.002 0.01 0.01 0.1	0.05 0.1 0.5 0.5	2.000000000000000000000000000000000000	20	000 <u>7</u> 000000
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MV1-7-20 15928-98 SOIL EB-7, TB-3, FB-1,	0.2 0.002 0.002 0.01 0.1	0.05 0.1 0.5 1 1 0.5	2000000 0 0 2200000 0 0	20	ผนผนผลตนผนน
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MU1-7-15 15928-97 SOIL EB-7, TB-3, FB-1,	0.2 0.002 0.002 0.01 0.1	0.05 0.1 0.5 1 1 0.5	2000000 2000000 2000000000000000000000	20	NNNN พพ NN NN
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SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	EP TOXICITY METALS Arsenic Selenium Mercury Silveer Cadmium Lead Chromium Barium	EP TOXICITY PESTICIDE HERBICIDE COMPOUNDS Gamma-BHC (Lindane) Endrin Methoxychlor Toxaphene 2,4.5 2,4,5,-TP	INORGANICS Antimony Thallium Lead Arsenic Selenium Mercury Silver Copper Beryllium Nickel Cadmium Chromium	TPH OIL & GREASE TOTAL ORGANIC CARBON	VOLATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene
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MV1-8-15 15928-99 801L EB-7, FB-1, FB-1,		14221222222222222222222222222222222222
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MW1-7 15928 SOIL EB-7, TB-3, FB-1,		
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le No Samplix Sam Sam Sam Sam Sam Sam Sam Sam Sam Sam	0	488488888888888888888888888888888888888
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SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	ene .	ether nine nane
8 Tec	Chloroform 1,2-Dichloroethane 2-Butanone 1,1,1-Trichloroethane Carbon Terrachloride Vinyl Acetate Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropene Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane Benzene 1,1,2-Trichloroethane Bromoform 4-Methyl-2-Pentanone 2-Hexanone Tetrachloroethene 1,1,2,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane Chlorobenzene Ethylbenzene Styrene Ictal Xylenes	1-VOLATILES (BY GC/MS) Phenol Bis(2-chloroethyl)ether 2-chlorophenol 1,3-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene 2-Methylphenol Bis(2-chloroisopropyl)ether 4-Methylphenol N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene 1sophorone 2-ditrophenol Benzol Acid Bis(2-chloroethoxy)methane 2,4-Dimethylphenol Bis(2-chloroethoxy)methane 2,4-Dichorophenol Bis(2-chloroethoxy)methane 4-Chloroeniline Hexachlorobitadiene Hexachlorobitadiene 4-Chloro-3-methylphenol
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ect No. – by L: -May	roeti rach rach rach room room room room room room room roo	S (8) Total
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Projenaly:	Chloroform 1,2-Dichloroethane 2-Butanone 1,1,1-Irichloroethane Carbon Tetrachloride Winyl Acctate Bromodichloromethane 1,2-Dichloroethane cis-1,3-Dichloroproper Trichloroethene 1,1,2-Trichloroethane Bromosom Frans-1,3-Dichloroproge Trichloroethane Trichloroethane Frans-1,3-Dichloroproge Frans-1,3-Dichloroproge Trichloroethane Frans-1,3-Dichloroproge Trichloroethane Checkloroethane Checkloroethane Tetrachloroethane Tetrachl	I-VOLATILES (BY GC/MS) Bis.(2-chloroethyl)ethe. 2-chlorophenol 1,3-bichlorobenzene 1,4-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene Bis.(2-chloroisopropyl) 4-Methylphenol Bis.(2-chloroisopropyl) 2,4-Dimethylphenol Benzoic Acid B
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∞	E-25	<u></u>

MW1-8-15 15928-99 SOIL SOIL 18-3, FB-1,	227273788888888888888837888378888888888
Sample No. : MW1-8 Lab Sample No : 15928 Matrix : SOIL Assoc Sample() : EB-7 Test FB-1 Result Flag Unit	39
Sample No. : MW1-7-20 Lab Sample No : 15928-98 Matrix : SOIL Assoc Sample(s) : EB-7, TB-3, FB-1, Result Flag Unit LLD	38 U ug/kg DB 77 77 U ug/kg DB 77 77 U ug/kg DB 77 78 U ug/kg DB 77 78 U ug/kg DB 77 77 U ug/kg DB 77 77 U ug/kg DB 77 77 U ug/kg DB 77 190 U ug/kg DB 38 38 U ug/kg DB 38 37 77 U ug/kg DB 38 77 77 U ug/kg DB 38 77 77 U ug/kg DB 77 77 77 U ug/kg DB
Sample No. : MW1-7-15 Lab Sample No : 15928-97 Matrix : SOIL Assoc Sample() : EB-7, Test FB-1, Result Flag Unit LLD	39 U ug/kg DB 78 78 U ug/kg DB 78 79 U ug/kg DB 78 78 U ug/kg DB 78
Sample No. : MW1-6-20 Lab Sample No : 15928-96 Matrix : SOIL Assoc Sample() : EB-6, TB-3, FB-1, Result Flag Unit LLD	39
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-789-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	2-Methylnapthalene Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,6-Trichlorophenol 2-Chloromapthalene 2-Nitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitroplenel 3-Nitroaniline Acenaphthene 2,4-Dinitrophenol Diethylphthalate 2,4-Dinitrophenol Diethylphthalate 2,4-Dinitrophenol Diethylphthalate 2,4-Dinitroophenol Diethylphthalate 4,6-Dinitroophenyl-phenylether Fluorene 4-Nitroaniline 4-Nitrosodiph:nylamine(1) 4-Bromophenyl-phenylether Hexachlorobenzene Pentachlorophenol Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Bentachlorobenzidine Bentachlorobenzidine Bentachlorobenzidine Bentachlorobenzidine Bentachloropenylphthalate Di-n-butylphthalate Bentachloropenzidine Bentachlorobenzidine Bentachloropenzidine

(1) Cannot be separated from Diphenylamine

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MU1-10-15 15928-103 SOIL EB-9, FB-2	0.002 0.002 0.01 0.01 0.01	0.05 0.1 0.5 0.5 0.5		20	
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		TOXICITY PESTICIDE/HERBICIDE COMPOUNDS Gamma-BHC (Lindane) Gamma-BHC (Lindane) Fandrin Methoxychlor Toxaphene 2,4-0 2,4.5,-1P			
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RP Pi rojek alys a Api	TOXICITY METALS Arsenic Setenium Mercury Silver Cadmium Lead Chromium Barium	TOXICITY PESTICIDE/ Gamma-BHC (Lindane) Endrin Methoxychlor Toxaphene 2,4-D 2,4,5,-TP	NGANICS Antimony Thallium Lead Arsenic Selenium Mercury Silver Copper Nickel Cadmium Chromium Zinc	L & C	ATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Acerone Acerone 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989			Antimon Thalliu Lead Arsenic Selenic Selenic Copper Berylli Nickl Cadmium Cadmium	TPH OIL & GREASE TOTAL ORGANIC CARBON	VOLATILE ORGANICS Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chlor Carbon Disulfic 1,1-Dichloroett 1,2-Dichloroett 1,2-Dichloroett
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MW1-9-20 15928-102 SOIL EB-8, TB-4,	777		22222222222222222222222222222222222222
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vo. ole Nc	Flag		
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MU1-9-15 15928-101 SOIL E8-8, T8-4, F8-2	ררם	NNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNNN	
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MW1-8-2 15928-1 SOIL EB-7, TB-3, FB-1	an		
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SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Chloroform 1,2-Dichloroethane 2-Butanone 1,1,1-Irichloroethane Carbon Tetrachloride Vinyl Acetate Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropene Trichloroethane 1,1,2-Irichloroethane Benzene 1,1,2-Irichloroethane Benzene 1,1,2-Irichloroethane Bromoform 4-Methyl-2-Pentanone 2-Rexanone 1,1,2,2-Ietrachloroethane 1,1,2,2-Ietrachloroethane Chlorobenzene Ethylbenzene Chlorobenzene Ethylbenzene Ethylbenzene Styrene	Phenol Bis(2-chloroethyl)ether 2-chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 2-Methylphenol 8 is(2-chloroisopropyl)ether 4-Methylphenol Nitrobenzene 1 sophorone 2 viitrophenol Nitrobenzene 1 sophorone 2 viitrophenol 2,4-Dimethylphenol 8 is(2-chloroethane 1,2,4-Dimethylphenol 8 is(2-chloroethoxy)methane 2,4-Dimethylphenol 8 is(2-chloroethoxy)methane 1,2,4-Trichlorobenzene 4-Chlorochanol 1,2,4-Trichlorobenzene Hexachlorobenzene Hexachlorobenzene 4-Chloro-3-methylphenol
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SAIC 1RP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs PRI Data April-May 1989	ian ee	1-VOLATILES (BY GC/MS) Phenol Bis(2-chloroethyl)ethe: 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 1,2-Dichlorobenzene 2-Methylchenol Bis(2-chloroisopropyl)ether 4-Methylchenol Bis(2-chloroisopropyl)ether Haxachloroethane Nitrobenzene 2-Nitrophenol Bis(2-chloroethane Nitrophenol 2,4-Dimethylchenol Benzoic Acid Benzoic Acid Benzoic Acid Benzoic Acid Benzoic Acid Haxachloroethoxy)methane 2,4-Dichorophenol 1,2,4-Trichlorobenzene Haxachlorobutadiene 4-Chloroetloroethoxy)methane 4-Chloroeniline 4-Chlorobutadiene 4-Chlorobutadiene 4-Chlorobutadiene
oe Fc 827-C 85 Té 39	Chloroform 1,2-Dichloroethane 2-Butanone 1,1,1-Trichloroethane 2-Buranon Tetrachloride Vinyl Acetate Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropane cis-1,3-Dichloroethane Benzene 1,1,2-Trichloroethane Benzene 2-Hexanone 1-1,2,2-Tetrachloroethane 1,1,2,2-Tetrachloroethane Chlorobenzene Chlorobenzene Ethylbenzene Styrene Total Xylenes	SEMI-VOLATILES (BY GC/MS) Phenol Bis(2-chloroethyl)ethur 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 2-Methylphenol Bis(2-chloroisopropyl)e 4-Methylphenol Bis(2-chloroisopropyl)e Nitrobenzene Isophorone 2,4-Methylphenol Bis(2-chloroethane Nitrobenzene 1 sophorone 2,4-Dichloroethane 1 2,4-Dimethylphenol Benzoic Acid Bis(2-chloroethoxy)meth 2,4-Dichorophenol 1,2,4-Trichlorobenzene Napthalene 4-Chloroaniline Hexachlorobutadiene 4-Chloroaniline Hexachlorobutadiene 4-Chloroaniline
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IRP Proj Maty	Chloroform 1, 2-Dichloroethane 2-Butanone 1, 1, 1-Trichloroethane Carbon Tetrachloride Vinyl Acetate 1, 2-Dichloromethane 1, 2-Dichloropropane cis-1, 3-Dichloropropane cis-1, 3-Dichloropropane 1, 1, 2-Trichloroethane Benzene 1, 1, 2-Trichloroethane Benzene Trichloroethane Benzene 1, 1, 2-Trichloroethane Elexanone 2-Hexanone 1, 1, 2-Tetrachloroetl Toluene Chlorobenzene Ethylbenzene Ethylbenzene Styrene Styrene	II-VOLATILES (BY GC// Phenol Bis.C2-chloroethyl)ei C-chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 2-Methylchenol Bis.C2-chloroisopropy 4-Methylchenol Bis.C2-chloroisopropy Hexachloroethane Ni trobenzene 2-Ni trophenol 2,4-Dimethylchenol Benzoic Acid Bis.C2-chloroethoxy) C2,4-Dimethylchenol C3,4-Dimethylchenol C4-Chlorochoxol
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Sample No. : M41-13-15 Lab Sample No : 15928-111 Matrix : 501L Assoc Sample() : EB-10, TB-5, Test Result Flag Unit LLD	39 U ug/kg DB 78 78 10 ug/kg DB 78 78 U ug/kg DB 78 78 19 ug/kg DB 78 78 78 19 ug/kg DB 78 78 78 19 ug/kg DB 78 78 78 78 19 ug/kg DB 78 78 78 78 78 78 78 78 78 78 78 78 78	90 RV/80 0
Sample No. : MW1-12-20 Lab Sample No : 15928-110 Matrix : SOIL Assoc Sample() : EB-10, TB-5, FB-2 Result Flag Unit LLD	***************************************	u ug/kg us
Sample No. : NW1-12-150 Lab Sample No : 15928-109 Matrix : SOIL Assoc Sample() : EB-10, TB-5, FB-2 Test Result Flag Unit LLD	0777979999999997999999999999999999	U vg/kg DB
Sample No. : HW1-12-15 Lab Sample No : 15928-108 Hatrix : 501L Assoc Sample() : EB-10, Test FB-2 Result Flag Unit LLD	100 100 100 100 100 100 100 100 100 100	U ug/kg DB
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	2-Methylnapthalene Hexachlorocyclopentediene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2,6,5-Trichlorophenol 2-introaniline Dimethylphthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrotoluene 3,4-Dinitrotoluene 3,4-Dinitrotoluene 4,4-Dinitrotoluene 5,4-Dinitrotoluene 5,4-Dinitrophenol Dibenzofuran 2,4-Dinitrotoluene 6,4-Dinitrotoluene Dienzofuran 2,4-Dinitrotoluene Dienzofuran 2,4-Dinitrotoluene Dienzofuran 2,4-Dinitrotoluene Dienzofuran 2,4-Dinitrotoluene Dienzofuran 4,5-Dinitrotoluene Diethylphthalate 4,5-Dinitro-2-Methylphenol N-Nitroaniline 4,5-Dinitro-2-Methylphenol N-Nitroaniline 4,5-Dinitro-2-Methylphenol N-Nitroaniline Fluoranthene Pentachlorophenol Phenanthrene Di-n-butylphthalate Di-n-butylphthalate Bis(2-ethylhexyl)phthalate Bis(2-ethylhexyl)phthalate Bis(3-a)-Direne Benzo(a)-Anthracene Benzo(b)-flouranthene Benzo(b)-flouranthene Benzo(k)-flouranthene Benzo(k)-flouranthene Benzo(k)-flouranthene Benzo(k)-flouranthene Indervo(1,2,3-d)pyrene	Benzo(g,h,i)perylene

(1) Cannot be separated from Diphenylamine

MU1-14-20 15928-114 SOIL EB-11, TB-5,	110	0.2 0.002 0.01 0.01 0.11	0.05 0.1 0.5 1 0.5	0000000 0 0 0000000 0 0	20	0.1	00000000000
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SAIC IRP Project - Joe foss Fie SAIC Project No. 01-827-03-769- Lab Analysis by Laucks Testing RI Data April-May 1989		TOXICITY METALS Arsenic Selenium Mercury Silver Cadmium Lead Chromium Barium	TOXICITY PESTICIDE/HERBICIDE Garra-BHC (Lindane) Endrin Hethoxychlor Toxaphene 2,4-0	RGANICS Antimony Thallium Lead Arsenic Selenium Hercury Silver Copper Co	TPH OIL & GREASE	TOTAL ORGANIC CARBON	VOLATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene
C IRI C Pr Ana Data		Arsenic Selenium Mercury Silver Cadmium Lead Chromium	TOXICI Garra-1 Endrin Hethox 2,4-D 2,4,5,	INORGANICS Antimony Thallium Lead Arsenic Selenium Mercury Silver Copper Beryllium Nickel Cadmium Chromium Zinc	011	AL OI	ATILE OF Chlorom Bromome Vinyl C Chloroe Acthore Acton 1,1-0ic 1,1-0ic
SAI SAI Lab RI		£	<u>a</u>	0	TPH	101,	Vol
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Chloroform 1,2-Dichloroethane 2-Ritanone	Test Result Flag 2 U c 2 U c 5 U c	ag Unit ug/kg ug/kg ug/kg	7 222	EB-10, 18-5, FB-2 LLD	E	יצי על יצ	. 255	EB-11, TB-5, FB-2 LLD	2	Ftag t U ug U ug	888	EB-11, TB-5, FB-2 LLD
2-Butanone 1,1,1-Trichloroethane Carbon Tetrachloride Cinyl Acceate Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropene	, , , , , , , , , , , , , , , , , , ,	49/kg 49/kg 49/kg 49/kg 49/kg		ភាពមានមេខាត	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	တို့တို့တို့တို့တို့တို့တို့တို့ ဘဘဘဘဘဘဘဘဘ		<i>ั</i> ผ <i>ิ</i> ผิดผลผลพลพ	พดพดพดพดพ		vg/kg 08 vg/kg 08 vg/kg 08 ug/kg 08 ug/kg 08 ug/kg 08	พดพดพดพด
1,1,2-Trickloroethane Benzene Benzene Bromoforms 1,3-Dickloropropene Bromoforms 4-Methyl-2-Pentanone 2-Hexanone 1,1,2,2-Tetrackloroethane 1,1,2,2-Tetrackloroethane Cklorobenzene Ethylbenzene Ethylbenzene Styrene Total Xylenes		6 4/6n 6		กกองการการการการการการการการการการการการการก	<i>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</i>		ug/kg 08 ug/kg 08 ug/kg 08 ug/kg 08 ug/kg 08 ug/kg 08 ug/kg 08 ug/kg 08 ug/kg 08 ug/kg 08	NNNNNNNNNNNNN	<i>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</i>		ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB	NNNNNNNNNNNNN
SEMI-VOLATILES (BY GC/MS) Phenol Bis(2-chlorocthyl)ether 2-chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene 2-Methylphenol Bis(2-chlorospropyl)ether 4-Methylphenol N-Nitroso-di-n-propylemine Hexachloroethane Nitrobenzene 1sophorone 2-Nitrophenol Scholoroethane 1,2,4-Dichorophenol Benzoic Acid Bis(2-chlorocthoxy)methane 2,4-Dichorophenol 1,2,4-Trichlorobenzene Hexachlorobutadiene 4-Chloroaniline Hexachlorobutadiene 4-Chlorooniline		63/60 63/60		28888888888888888888888888888888888888	*************************		49/kg DB 49/	\$	%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	49/kg D8 49/kg D8	%%%%%%%%%%%%%%%%%%%%

MW1-14-15 Sample No. : HW1-14-20 15928-113 Lab Sample No : 15928-114 SOIL Matrix : SOIL EB-11, Assoc Sample() : EB-11, TB-5, TB-5, FB-2 Test : LLD	39 39 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Sample No. Lab Sample No : Matrix Assoc Sample() : Test Result Flag Unit	0.000000000000000000000000000000000000
Sample No. : MW1-13-20 Lab Sample No : 15928-112 Matrix : 501L Assoc Sample() : E8-10, T8-5, F8-2 Test Result Flag Unit LLD	2 C C C C C C C C C C C C C C C C C C C
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	2-Methylnapthalene Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Mitroaniline Dimethylphthalate Acenaphthylene 2,6-Dinitroaniline 3,Nitroaniline Acenaphth c 2,4-Dinitroaluene Dibenzofuran 2,4-Dinitroaluene Fluorene 4,6-Dinitro-2-Methylphenol M-Nitroaniline 4,6-Dinitro-2-Methylphenol M-Nitroaniline Phenanthrene Phenanthrene Phenanthrene Phenanthrene Di-n-butylphthalate Butylbenzylphthalate Butylbenzylphthalate Brisg-ethylbenzylphthalate Brisg-ethylphthalate Brisg-ethylphthalate Brisg-ethylphthalate

(1) Cannot be separated from Diphenylamine

SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Sample No. Lab Sample No Matrix Assoc Sample()	No SteC)	83-1-6 15928 501L EB-4,	B3-1-0 15928-80 SOIL EB-4,	Sample No. Lab Sample No Matrix Assoc Sample()	e No. ample No k Sample()		B3-1-5 15922-81 SOII. E8-4, TB-3,	Sambie No. Lab Sample No Matrix Assoc Sample()	. No. ample No (Sample()		B3-2-0 15928-82 SOIL EB-4, TB-3,	Sample No. Lab Sample No Matrix Assoc Sample()	No ole()		B3-2-00 15928-83 SOIL E8-4, T8-3,
	Test Result F	Flag	Unit	 	Test Result	Flag	Sit .	1.6.	Test Result	Flag	Unit E	L-10 CTO	Test Result	Flag U	, FB. Unit	. פון
EP TOXICITY METALS Arsenic Selenium Mercury Silver Cadmium Lead Chromium Barium	0.2 0.002 0.1 0.01 0.1 0.1		7/6w 7/6w 7/6w 7/6w 7/6w 7/6w 7/6w 7/6w	0.002 0.002 0.01 0.01 0.01	0.2 0.002 0.1 0.1 0.1 0.1	222222	1/5u 1/6u 1/7c 1/6u 1/7c 1/6u 1/7c 1/6u 1/7c	0.2 0.002 0.1 0.01 0.1	0.02 0.002 0.01 0.01 0.01	222222	7/6u 1/6u 1/6u 1/7u 1/6u 1/6u 1/6u 1/6u 1/6u	0.2 0.002 0.1 0.1 0.1	0.22 0.002 0.01 0.01 0.11	7/6w 7/6w 0 1/6w 0 1/6w 0 1/6w 0 1/6w 0 0 1/6w 0 0 1/6w 0 0 1/6w 0 0 1/6w 0 0 1/6w 0 0 1/6w 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0.00.2 0.00.2 0.01 0.01 0.11
EP TOXICITY PESTICIDE/HERBICIDE COMPOUNDS Gamma-BHC (Lindane) Endrin Hethoxychlor Toxaphene 2,4-D 2,4,5,-TP	OUNDS 0.05 0.1 0.5 1 1.0 0.50	55555	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	0.05 0.1 0.5 1	0.05 0.1 0.5 0.5	ככככככ	7/6n 7/6n 7/6n 7/6n 1/6n 1/6n	0.0 0.1 0.5 1 1 1 5.0	0.00 0.10 0.5 0.5	כככככ	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	0.05 0.1 0.5 1 1 0.5	0.05 0.1 0.5 0.5	7/6n n 1/6n n 1/6n n 1/6n n 1/6n n 1/6n n		0.05 0.1 0.5 1
INDRGANICS Antimony Thallium Lead Arsenic Selenium Hercury Silver Copper Beryllium Nickel Cadmium Chromium Zinc	2.0 8.7.5 6.0 6.7.7 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0		mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB	00000000000000000000000000000000000000	2.5 2.4 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5	ם כככ ככ	mg/kg 08 mg/kg 08 mg/kg 08 mg/kg 08 mg/kg 08 mg/kg 08 mg/kg 08 mg/kg 08 mg/kg 08 mg/kg 08	0000000 0 0000000 0 0000000 0	2.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8.0 8	כ כככ ככ	mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB	200000000 2200000000000000000000000000	2000.000.000.000.0000.0000.0000.0000.0	0 mg/kg 0 mg/kg 0 mg/kg 0 mg/kg 0 mg/kg 0 mg/kg 0 mg/kg 0 mg/kg 0 mg/kg	22222222222222222222222222222222222222	%%%%%% %%%%%% %%%%%% %
TPH OIL & GREASE	120	¥.	19/kg DB	50 50	90 1			50	65 !			50 50	% !	/Bu		50
VOLATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane Vinyl Chlorothane Hethylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethene 1,1-Dichloroethene 1,2-Dichloroethene	3445484444			- 4445484444	20 20 20 20 20 20 20 20 20 20 20 20 20 2	בככב הכככם	7 08 00/kg 08 00/kg 08 00/kg 08 00/kg 08 00/kg 08 00/kg 08 00/kg 08 00/kg 08	20 20 77 77 77	N 2002	בכככב ככככ	% DB % DB nd/k3 DB	. 2223 2022 	<u>₹</u> 2000000	% /66 /66 /66 /66 /66 /66 /66 /66 /66 /6	2 DB	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

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83-2-00 15928-83 SOIL EB-4, TB-3, FB-1		
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83-2- 15928 801L E8-4, T8-3, F8-1		
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B3-1-5 15928-81 S01L E8-4, TB-3, FB-1		
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83-1-0 15928-80 SOIL EB-4, TB-3, FB-1		
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SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		<u>.</u>
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Joe F. -827-1 cks T. 789	re thane ride ane oropei coprod one one oropei	CC/MS L) eth ene ene ene ropyl: ropyl: cy)mei cy)mei li ence snzene
t 5. 01: 7. Lau (ay 15	Sethai loroel sethoi loroet vometh co	(BY (Sethylog) Sethylogol Senzi Sen
Project Mc Sis by	orm one richl Tetra Tetra cetal	illes inlord opper inlord inlord illord inlo
IRP F Proje Inalys Ita Ap	Chloroform 1,2-Dichloroethane 2-Butanone 1,1,1-Trichloroethane Carbon Tetrachloride Vinyl Acetate Bromcdichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropane Trichloroethane Dibromochloromethane 1,1,2-Trichloroethane Benzene 1,1,2-Trichloroethane 2-Hexanone Tetrachloroethene 1,1,2-Tetrachloroethane Chlorobenzene Ethylbenzene Ethylbenzene Styrene	Phenot Bis(2-chloroethyl)ether 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 2-Methylphenol Bis(2-chloroisopropyl)ether 4-Methylphenol N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene 1 sophorone 2-Nitrophenol Benzoic Acid Bis(2-chloroethoxy)methane 2,4-Dimethylphenol Benzoic Acid Bis(2-chloroethoxy)methane 2,4-Dichorophenol 1,2,4-Trichlorobenzene Mapthalene 4-Chloroaniline Hexachlorobutadiene 4-Chloroaniline
SAIC SAIC Lab A RI Da	ウィング 1 2 2 2 1 2 1 2 1 2 2 2 3 3 2 4 2 2 1 1 2 2 B 3 2 B 4 2 2 1 1 2 2 B 3 2 B 4 2 2 B 4	

83-2-00 15928-83 201L EB-4, FB-1 FB-1	788878778779877827788888888888888888888
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Sample No. Lab Sample No Matrix Assoc Sample(Test Result Flag	288884846646648446864464668888888888888
B3-2-0 15928-82 SOIL EB-4, FB-1	338
e No : e No : sple() : Flag Unit	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag	**************************************
B3-1-5 15928-81 SOIL E8-4, T8-3, F8-1	48884844864464486486444864444444444444
e No : ple() : Flag Unit	60/60 DB 60/
Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag	588884448844488644444444444444444444444
83-1-0 15928-80 301L E8-4, T8-3, F8-1	33333700000000000000000000000000000000
	60/kg 08 60/kg 08 60/
Sample Mc Lab Sampl Matrix Assoc San Test Result	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	2-Methylnapthalene Hexachlorocyclopentadiene 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloroapthalene Dimethylphthalate 2-Mitroaniline Acenaphthylene 2,4-Dinitrotoluene 3-Mitrophenol Dibenzofuran 2,4-Dinitrotoluene 2,4-Dinitrotoluene 1,2,4-Dinitrotoluene 2,4-Dinitrotoluene 2,4-Dinitrotoluene 2,4-Dinitrotoluene Diehtylphthalate 4-Nitroaniline 4-Oinitro-2-Methylphenol N-Nitrosodiphenyl-phenylether Fluorene 4-Dinitro-2-Methylphenol N-Nitrosodiphenyl-phenylether Fluorane 1,5-Dinitro-2-Methylphenol M-Nitrosodiphenyl-phenylether Fluorane Pentachlorobenzene Pentachlorobenzene Pentachlorobenzene Pyrene Bisyl-Dichlorobenzidine Benzo(a)anthracene Benzo(a)anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(a)pyrene Benzo(a)pyrene Indeno(1,2,3-d)pyrene Indeno(1,2,3-d)pyrene Benzo(a,h)anthracene Benzo(a,h,i)perylene

(1) Cannot be separated from Diphenylamine

SAIC IRP Project - Joe Foss Field Sample No. SAIC Project No. 01-827-03-769-22 Lab Sample No Lab Analysis by Laucks Testing Labs Matrix RI Data April-May 1989 Assoc Sample()	Test Result Flag	TOXICITY METALS NT mg Arsenic NT mg Selenium NT mg Mercury NT mg Cadmium NT mg Lead NT mg Chromium NT mg Barium NT mg	TOXICITY PESTICIDE/HERBICIDE COMPOUNDS Gamma-BHC (Lindane) 0.05 U ug Endrin 0.1 U ug Methoxychlor 0.5 U ug Toxaphene 1 U ug 2,4-0 1 U ug	NOT NOT	TPH OIL & GREASE NT mg	VOLATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane 2 U ug Vinyl Chloride 2 U ug Chloroethane Rethylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethane 1,1-Dichloroethane 2 U ug
: 83-2-5 : 15928-84 : 501L : E8-4, : 18-3,	Unit LLD	mg/L 0.2 mg/L 0.02 mg/L 0.002 mg/L 0.01 mg/L 0.01 mg/L 0.1 mg/L 0.1	ug/L 0.05 ug/L 0.1 ug/L 0.5 ug/L 1 ug/L 1	mg/kg D8 2.5 mg/kg D8 0.5 mg/kg D8 0.5 mg/kg D8 0.5 mg/kg D8 0.5 mg/kg D8 0.1 mg/kg D8 0.1 mg/kg D8 0.1 mg/kg D8 0.6 mg/kg D8 0.1 mg/kg D8 0.1 mg/kg D8 0.5 mg/kg D8 0.5	mg/kg DB 20 % DB 0.1	ug/kg DB 2 ug/kg DB 2 ug/kg DB 2 ug/kg DB 6 ug/kg DB 6 ug/kg DB 10 ug/kg DB 10 ug/kg DB 2 ug/kg DB 2
Sample No. : B3 Lab Sample No : 15 Matrix : SO Assoc Sample() : EE	Test Resu't Flag Unit	0.2 U mg/L 0.2 U mg/L 0.002 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L	0.05 U ug/L 0.1 U ug/L 0.5 U ug/L 1 U ug/L 1 U ug/L 0.5 U ug/L	2.5 U mg/kg DB 6.2 U mg/kg DB 8.9 mg/kg DB 0.5 U mg/kg DB 0.1 U mg/kg DB 0.6 U mg/kg DB 0.3 mg/kg DB 23 mg/kg DB 23 mg/kg DB 46 mg/kg DB 24 mg/kg DB	34 mg/kg DB	170 U ug/kg DB 170 U ug/kg DB 170 U ug/kg DB 500 U ug/kg DB 170 U ug/kg DB 170 U ug/kg DB 170 U ug/kg DB
B3-3-00 15928-85 SOIL EE-4, TB-3,	. 17	0.2 0.002 0.1 0.1 0.1 0.1	0.05 0.1 0.5 1 1 0.5	20000000000000000000000000000000000000	20	. 170 170 170 170 500 170 170 170
Sample No. : B Lab Sample No : 1 Matrix : S Assoc Sample() : E	Test Result Flag Unit	0.2 U mg/L 0.02 U mg/L 0.002 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L	0.05 U ug/L 0.1 U ug/L 0.5 U ug/L 1 U ug/L , 1 U ug/L , 0.5 U ug/L	2.5 U mg/kg DB 0.5 U mg/kg DB 7.9 mg/kg DB 8.4 mg/kg DB 0.5 U mg/kg DB 0.1 U mg/kg DB 11 mg/kg DB 0.3 mg/kg DB 21 mg/kg DB 21 mg/kg DB 12 mg/kg DB 49 mg/kg DB	130 mg/kg DB NT % DB	370 U ug/kg DB 370 U ug/kg DB 370 U ug/kg DB 1100 U ug/kg DB 370 U ug/kg DB 370 U ug/kg DB 370 U ug/kg DB
B3-3-00 15928-86 SOIL EB-4, FB-1		0.002 0.002 0.01 0.01 0.11	0.05 0.1 0.5 1 1 0.5	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	20	370 370 1370 1370 370 370
Sample No. : Lab Sample No : Matrix : Assoc Sample() :	Test . Result Flag Unit	8,8,8,8,8,8,8	0.05 U ug/L 0.1 U ug/L 0.5 U ug/L 1 U ug/L 1 U ug/L 0.5 U ug/L	2.5 U mg/kg DB 0.5 U mg/kg DB 11 mg/kg DB 7.0 mg/kg DB 0.5 U mg/kg DB 0.1 U mg/kg DB 0.6 U mg/kg DB 14 mg/kg DB 0.7 mg/kg DB 22 mg/kg DB 20 mg/kg DB 71 mg/kg DB	110 mg/kg DB	7/5n n n n n n n n n n n n n n n n n n n
83-3-2.5 15928-87 SOIL E8-4, 18-3,	TED TED	0.2 0.002 0.102 0.11 0.01 0.11	0.05 0.1 0.5 1 1	2.000000000000000000000000000000000000	20	190 190 190 190 190 190

83-3-2.5 15928-87 501L EB-4, TB-3, FB-1	864 864 864 864 864 864 864 864 864 864	730 730 730 730 730 730 730 730 730 730
: : :	ug/kg DB ug/kg DB	49/kg DB 49/kg DB
). le No mple() flag	22222222222222222 DW	ממנ מככנכנכנכנכנכנכנכ
Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag		739 739 739 739 739 739 739 739 739 739
83-3-00 15928-86 15928-86 1591 18-4, 18-3, 18-1	370 370 370 370 370 370 370 370 370 370	330 330 330 330 330 330 330 330 330 330
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Sample No. Lab Sample Matrix Assoc Sampl Test Result Fl	370 370 370 370 370 370 370 370 370 370	388 388 388 388 388 388 388 388 388 388
83-3-00 15928-85 2011 8914, 18-3, FB-1	515 561 571 571 571 572 573 574 575 576 577 577 578 579 571 571 571 571 571 571 571 571 571 571	380 380 380 380 380 380 380 380 380 380
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	63/ka	09/kg
No. Imple No Sample()		
Sample No. Lab Sample Matrix Assoc Sampl Test Result Fl		380 380 380 380 380 380 380 380 380 380
83-2-5 15928-84 2011 2014 18-3, 18-3, 10	NNDVNVNVNVNVNVNVNVNNNN	25555555555555555555555555555555555555
		000000000000000000000000000000000000000
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Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag		# · · · · · · · · · · · · · · · · · · ·
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Chloroform 1,2-Dichloroethane 2-Butanone 1,1,1-Trichloroethane Carbon Tetrachloride Vinyl Acetate Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropane Trichloroethane Dibromochloromethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane Benzene trans-1,3-Dichloropropene Bromoform 4-Methyl-2-Pentanone 2-Hexanone Tetrachloroethene 1,1,2,1etrachloroethane Toluene Chlorobenzene Ethylbenzene Ethylbenzene Styrene	SEMI-VOLATILES (BY GC/MS) Phenol Bis(2-chloropthenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene 2-Methylphenol Bis(2-chlorobenzene 6 is(2-chlorobenzene 7-Methylphenol N.Nitroso-di-n-propylamine Haxachloroethane Isopharone 2-Nitrophenol 2,4-Dimethylphenol Benzoic Acid Bis(2-chloroethoxy)methane 2,4-Dichorophenol 1,2,4-Trichlorobenzere Mapthalene 4-Chloroaniline Hexachlorobutadiene 4-Chloroaniline
	E-43	

B3-3-2.5 15928-87 3011 EB-4, FB-1 FB-1	600 600 600 600 600 600 600 600 600 600	860
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Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag	\$22 \$22 \$23 \$23 \$23 \$23 \$23 \$23 \$23 \$23	798 200
B3-3-0D 15928-86 201L EB-4, TB-3, FB-1	25	
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag	28 28 28 28 28 28 28 28 28 28 28 28 28 2	1 087
83-3-00 15928-85 15928-85 15928-85 16-3, 18-3, 18-1	88	09/
	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	ug/kg DB
Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag	3800 U 38	n 092
B3-2-5 15928-84 SOIL EB-4, TB-3, FB-1	-	82
: : :		ug/kg DB
Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag		85 U
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-789-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	2-Methylnapthalene Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronapthalene 2-Mitroaniline Acenapthylene 2,6-Dinitrotoluene 3-Mitrophenol 4-Nitrophenol Diethylphthalate 2,4-Dinitrophenol 4-Nitrophenol Diethylphthalate 4,6-Dinitrocoloune Diethylphthalate 4,6-Dinitrocoloune Diethylphthalate 4-Nitrosniline 4-Nitrosniline 4-Nitrosniline 6-Mitrosniline 6-Mitrosniline 7-Benachlorophenyl-phenylether Hexachlorophenyl-phenylether Hexachlorophenyl-phenylether Hexachlorophenyl-phenylether Hexachlorophenyl-phenylether Hexachlorophenyl-phenylether Hexachlorobenzene Pentachlorophenyl-phenylether Hexachlorobenzene Di-n-butylphthalate Fluoranthene Benzo(a)anthracene Chrysene Benzo(a)anthracene Benzo(a)flouranthene Benzo(b)flouranthene Benzo(a)pyrene Di-n-octyl phthalate Benzo(a)pyrene Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene

(1) Cannot be separated from Diphenylamine

83-3-2.5 15928-87 SOIL EB-4, TB-3, FB-1	25 25 25 25 25 25 25 25 25 25 25 25 25 2
 r	197, kg DB 198, kg DB
No.	370 370 370 370 370 370 370 370
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83-3-00 15928-86 SOIL EB-4, FB-1 FB-1	#######################################
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Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag	·
83-3-00 15928-85 Soil EB-4, FB-1 FB-1	
83-3- 15928 SOIL EB-4, FB-1	
	60 63 63 08 63 63 63 63 63 63 63 63 63 63 63 63 63
n 9	87/60 67/60
No. ple No ample() Flag	
Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag	
2-5 28-84 L 4, 3, 1	
83-2-5 15928-84 SOIL E8-4, T8-3, F8-1	
: : :	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
_	64/60 64/60
lo. ole No smple() Flag	
Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Chloromethane Bromomethane Vinyl Chloride Chloroethane Hethylene Chloride Caloroethane Carbon Disulfide 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Butanone 1,1-Trichloroethane 2-Butanone 1,1-Trichloroethane 2-Butanone 1,1,1-Trichloroethane 2-Butanone 1,1,1-Trichloroethane 2-Butanone 1,1,1-Trichloroethane Bromodichloromethane 1,2-Dichloroethane 1,2-Dichloroethane Bromochloromethane 1,2-Dichloroethane 1,2-Dichloroethane Bromochloromethane 1,1,2-Trichloroethane Brannochloromethane 1,1,2-Trichloroethane Brannoform 4-Methyl-2-Pentanone 2-Methyl-2-Pentanone 2-Methyl-2-Pentanone 1,1,2,2-Tetrachloroethane Ictrachloroethene 1,1,2,2-Tetrachloroethane Ictrachloroethene Illinomochloroethene

83-5-2.5 15928-91 SOIL EB-5, 19-3, FB-1	110	0.2	0.002 0.1	000	0.05	0.5	0.5	2.5	0.00			- ~ .		20	0.1	~~	1000	, 5 v	0 0 N	
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Sample No. Lab Sample Matrix Assoc Sampl	Test Result	0.2	0.002 0.1	1.000	0.05	0.5	0.5	2.5 2.5	2.0	 	52.5	583	65 65	25	2.2	<i>~~</i>	10.01	, <u>5</u> %	<i>~~~</i>	
B3-5-0 15928-90 SOIL EB-5, FB-1	1	0.2	0.02 0.1 0.01	000	0.05	0.0	0.5	%0.0 %.v.n						50	0.1				~~~	
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83-4-5 15928-89 SOIL EB-5, TB-3,	ררס	0.2	0.002 0.1 0.01		0.05	0.0	0.5	200						3 20	0.1				~~~	
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	J Unit	mg/L mg/L	7 <u>6</u> 1 7 6 1 2 7 6 1 2 7 6 1	1/6m 1/6m 1/6m	7/60	1/6n 1/6n 1/6n	1/6n 1/6n	mg/kg mg/kg) B	6 4 7 6 E	2	5	mg/k/k	mg/kg	×	/6n	65	5 5 5	ug/kg ug/kg ug/kg	
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83-4-0 15928-88 SOIL E8-5, T8-3, F8-1	ררם	0.5	0.07		0.05	 	0.5	5.00 5.00 5.00		000	-	. ~ .		20	0.1				~~~	
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e No pte	Flag			5 5		מככ		220	, :	ם ב	,	=	-	¬			פכי		222	
Sample No. Lab Sample No Matrix Assoc Sample()	Test Result	0.2	0.00 0.1 0.01	0.0 0.3	OUNDS 0.05	0.5	0.5	2.5 2.5 2.5	900	0.00	8.	. K. J.	825	50	2.4	~ ~	100	. <u>6</u> 2	<i>~~~</i>	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	0.141712 >1401501	Arsenic Selenium	nercury Silver Cachnicm	Lead Chromium Barium	EP TOXICITY PESTICIDE/HERBICIDE COMPOUNDS Garma-BHC (Lindane)	Endrin Hethoxychlor Toxaphene	2,4-D 2,4,5,-TP	INORGANICS Antimony Thallium	Arsenic	Selenium Mercury Silver	Copper Beryllium	Nickel Codmission	Chromium Zinc	TPH OIL & GREASE	TOTAL ORGANIC CARBON	VOLATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane	Vinyl Chloride Chloroethane	Acetone Carbon Disulfide	1,1-Dichloroethene 1,1-Dichloroethane 1,2-Dichloroethene (total)	•

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83-5-2.5 15928-91 SOIL EB-5, TB-3,	110																										•	.	r V	. 7	7	r <	7	r V	. 7	· ~	7	r 9	J \	* `	70	5 5	1 6	₹.	4	∞	7	α	3	1.	4	٥
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Sample No. Lab Sample No Matrix Assoc Sample(Result																											•			•		•	7	7		7		•	•	,	•	4 (0001	7	₩	7	•	•	.	4	
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83-5-0 15928-90 SOIL E8-5, 18-3, F8-1	=	i																																									•	_								
83-5- 15928 801L 68-5, 18-3,	ų	,	8 8						80																																	8 6								200	80	
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SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Iesting Labs RI Data April-May 1989			chlororum 1,2-Dichloroethane		1.1.1-Trichloroethane	Carbon Tetrachloride	Vinyl Acetate	Bromodichloromethane	1,2-Dichloropropane	cis-1,3-Dichloropropene	Trichloroethene	Dibromochloromethane	1.1.2-Trichloroethane		trans-1 3-Dichloropropene		A-Wathyl -2-Bestands	4-Hetnyt-z-rentanone		Tetrachloroethene	1,1,2,2-Tetrachloroethane		Chlorobenzene	Ethylbenzene		Total Xylenes	SEMI-VOLATILES (BY GC/MS)		Bis(2-chloroethyl)ether	Z-Chlorophenol	1, 3-01ch (orobenzene	1,4-Dichlorobenzene	Benzyl alcohol	1,2-Dichlorobenzene	enot.	81s(2-chlorotsopropyl)ether	4-Methylphenol	N-Nitroso-di-n-propylamine	Hexachloroethan e	Nitrobenzene		2-Nitrophenol	!pheno!	'n	cortoxy)methane	oc mody/me.mane	2,4-Dichorphieriol	1 oropenzene		4-Chloroaniline	Joseph Orobertadione	

Sample No. : 83-5-2.5 L.b. Sample No : 15928-91 Matrix : 501L Assoc Sample() : EB-5, 1B-3, FB-1 Result Flag Unit LLD	40 U ug/kg DB 61 CO U ug/kg DB 70 CO CO CO U ug/kg DB 70 CO	U UG/KG UB
Sample No. : B3-5-0 Lab Sample No. : 15928-90 Matrix : 501L Assoc Sample() : E8-5, T8-3, F8-1 Result Flag Unit LLD	150 U ug/kg DB 150 150 U ug/kg DB 150 150 U ug/kg DB 150 170 U ug/kg DB 150 171 U ug/kg DB 150 172 U ug/kg DB 177 170 U ug/kg DB 170 170 U ug/kg	ug/kg DB
Sample No. : B3-4-5 Lab Sample No : 15928-89 Matrix : SOIL Assoc Sample() : EB-5, FB-1 Test FB-1	42 U ug/kg DB	U ug/kg DB
Sample No. : B3-4-0 Lab Sample No : 15928-88 Matrix : SOIL Assoc Sample() : E8-5, 18-3, FB-1 Test Result Flag Unit LLD	43 U ug/kg DB 65	U ug/kg D8
SAIC IRP Project - Joe foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	2-Methylnapthalene Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronapthalene 2-Nitroaniline Acenaphthylene 2,6-Dinitrotoluene 3-Mitroaniline Acenaphthene 2,4-Dinitrotoluene 3-Mitroaniline Acenaphthene 2,4-Dinitrotoluene 0;9-Dinitrotoluene 0;9-Di	Benzo(g,h,i)perylene

(1) Cannot be separated from Diphenylamine

ORE Sample No. : 116 Lab Sample No : Matrix : Assoc Sample() : Test Result Flag Unit	.2 0.2 U mg/L .2 0.02 U mg/L 0.1 U mg/L 0.1 U mg/L 0.1 U mg/L .1 0.1 U mg/L .1 0.1 U mg/L .1 0.2 mg/L	0.5 0.05 U ug/L 0.1 U ug/L 0.5 U ug/L 1 1 U ug/L 1 U ug/L 0.5 U ug/L	2.5 U mg/kg 0.5 U mg/kg 0.5 U mg/kg 0.5 1.8 mg/kg 0.1 U mg/kg 0.1 U mg/kg 0.1 U mg/kg 1 2 mg/kg 0.1 U mg/kg 1 0.1 U mg/kg 1 0.1 U mg/kg 0.1 0.5 U mg/kg 1 0.1 U mg/kg 1 0.5 U mg/kg 1 0.5 U mg/kg	20 31 mg/kg 0.9 % DB	. 2 0 ug/kg 2 2 0
5. : BK-2-20RE Le No : 15928-116 : 501L rple() : EB-11, TB-5, FB-2	mg/L 0.2 mg/L 0.02 mg/L 0.002 mg/L 0.01 mg/L 0.01 mg/L 0.1	ug/L 0.05 ug/L 0.1 ug/L 0.5 ug/L 1.1 ug/L 0.5	mg/kg DB 78 mg/kg DB 0	mg/kg DB 20 % DB 0.1	U ug/kg DB U ug/kg DB U ug/kg DB U ug/kg DB U ug/kg DB U ug/kg DB U ug/kg DB
Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag		Y X Y X X X	***********	T N	นนนน _น ซีนนทน
BK-2-20 15928-116 SOIL EB-11, TB-5, FB-2	0.002 0.002 0.01 0.01 0.01	0.05 0.1 0.5 1	008 00 0.55 00	8 20	008 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
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BK-2-15 15928-115 SOIL EB-11, TB-5, FB-2	0.22 0.002 0.01 0.01 0.11	0.05 0.5 0.5 0.5	4.0000000 0 0 4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.	100	กทกหลดงกทก
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SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	TOXICITY METALS Arsenic Selenium Mercury Silver Cadmium Lead Chromium Barium	TOXICITY PESTICIDE/HERBICIDE COMPOUNDS Gamma-BHC (Lindane) Endrin Methoxychlor Toxaphene 2,4-0		TPH OIL & GREASE TOTAL ORGANIC CARBON	VOLATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethene 1,1-Dichloroethene 1,2-Dichloroethene

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BK-2-25 15928-117 SOIL EB-11, TB-5, FB-2		3&&3&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&
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Pro oject lysis Apri	chloroform 1,2-Dichloroethane 2-Butanone Carbon Tetrachloroethane Carbon Tetrachloride Vinyl Acetate Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropane Trichloroethene Trichloroethene Tothloroethane Benzene Trichloroethane Benzene Trichloroethane C-Hexanone Tetrachloroethane Tothloroethane C-Hexanone Tetrachloroethane Tothlorobenzene Ethylbenzene Ethylbenzene Styrene	1-VOLATILES (BY GC/MS) Phenol Bis(2-chloroethyl)ether 2-chlorophenol 1,3-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene Benzyl alcohol 2-Methylphenol N-Mitroso-di-n-propylamine Hexachloroethane Isophorone 2-Witrophenol Benzolc Acid Benzolc Acid Benzolc Acid Benzolc Acid Benzolc Acid A-Utrichloroethoxy)methane 2,4-Dimethylphenol Benzolc Acid
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Chloroform 1,2-0ichloroethane 2,5-Butanone 1,1-Trichloroethane Carbon Tetrachloride Vinyl Acetate Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropane cis-1,3-Dichloroethane Bromochloromethane 1,1,2-Trichloroethane Bromochloromethane Erans-1,3-Dichloroethane C-Hexanone Tetrachloroethane 1,1,2-Trichloroethane C-Hexanone Tetrachloroethane C-Hexanone Tetrachloroethane C-Horobenzene Chlorobenzene Ethylbenzene Styrene	SEMI-VOLATILES (BY GC/MS) Phenol Bis(2-chloroethyl)ether 2-Chlorophenol 1,3-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene 2-Methylphenol Bis(2-chloroisopropyl)ether 4-Methylphenol N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene Isophorone 2-Mitrophenol 2,4-Dimethylphenol Benzoic Acid Bis(2-chloroethane 1,2,4-Trichlorobenzene 1,2,4-Trichlorobenzene 1,2,4-Trichlorobenzene 1,2,4-Trichlorobenzene Hexachlorobenzene 1,2,4-Trichlorobenzene Hexachlorobenzene 1,2,4-Trichlorobenzene 4-Chloroaniline 4-Chloroaniline 6-Chloroaniline 6-Chloroaniline 6-Chloroaniline
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6K-2-20 15928-116 SOIL EB-11, TB-5, FB-2	**************************************
6K-2-3 15928-301L 801L EB-11 FB-2	
 	84/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60 64/60
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Sample No. Lab Sample No Matrix Assoc Sample() Test Result Flag	82558888888888888888888888888888888888
BK-2-15 15928-115 15928-115 1011 18-11, 18-5, 18-2	324747333333334743334743334747474743334747474747474747474747474747474747474747
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e No ple() Flag	
Sample No. Lab Sample No Matrix Aşsoc Sample() Test Result Flag	######################################
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	2-Methylnapthalene Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronapthalene 2-Nitroaniline Acenaphthylene 3,6-Dinitrocoluene 3-Nitroaniline Acenaphthene 2,4-Dinitrocoluene 3,4-Dinitrocoluene 3,4-Dinitrocoluene 3,4-Dinitrocoluene 3,4-Dinitrocoluene 5,4-Dinitrocoluene 0 iehylphthalate 6,4-Dinitrocoluene 0 iehylphthalate 7-Inorophenyl-phenylether 6,0-Dinitrocoluene 0 iehylphthalate 6,0-Dinitrocoluene 0 iehylphthalate 6,0-Dinitro-2-Methylphenol N-Nitrosodiphenylempler 6,0-Dinitro-2-Methylphenol N-Nitrosodiphenylempler 6,0-Dinitro-2-Methylphenol N-Nitrosodiphenylempler 6,0-Dinitro-2-Methylphenol N-Nitrosodiphenylempler 6,0-Dinitro-2-Methylphenol N-Nitrosodiphenylempler 6,0-Dinitro-2-Methylphenol 8-Dinitro-2-Methylphenol 8-Dinitro-2-Methylphenol 8-Dinitro-2-Methylphenol 8-Dinitrocolophenol 8-Dinitro-2-Methylphenol 8-Dinitro-3-Methylphenol 8-Dinitro-3-

(1) Cannot be separated from Diphenylamine

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BK3-20 15928-120 SOIL EB-1ï, TB-6, FB-2	ררם	0.2 0.002 0.1 0.01 0.1 0.1	0.05 0.11 0.5 1 1 0.5	20.000000 0 0 22.00000 0 0	26 0.1	<b>กททพทพพทท</b>
	Unit	7/6w 7/6w 7/6w 7/6w 7/6w 1/6w 1/6w 1/6w	7/6n 7/6n 7/6n 1/6n 1/6n 1/6n	mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB	mg/kg DB % DB	ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB
e K	Flag	222222	22222	כ כ כככ ככ	5	ממכם מממכ
Sample No. Lab Sample No Matrix Assoc Sample()	Test Result	0.2 0.002 0.002 0.01 0.01	0.05 0.15 0.5 1 1 1	25.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55 20.55	20	<u> </u>
BK3-5 15928-119 S01L EB-11, 18-6, FB-2	777	0.2 0.002 0.01 0.01 0.11 0.11	0.05 0.11 0.51 1	90000000 0 0 88888866	20	<b>ท</b> กทพพพทกท
	Unit	7/6w 1/6w 1/6w 7/6w 1/6w 1/6w 1/6w 1/6w	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB	mg/kg DB % DB	ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB
e No. ample No k Sample()	Flag	222222	22222	כ כככ ככ		ככככ כככככ
Sample No. Lab Sample No Matrix Assoc Sample()	Test Result	0.2 0.002 0.10 0.1 0.1 0.1	0.05 0.15 1 1 1 1 1 1	2.00 2.00 2.00 2.00 2.00 2.00 2.00 2.00	9.0	ุกกกก _ั นหนากก
8K3-0.5 15928-118 S01L E8-11, T8-6, F8-2	77	0.2 0.02 0.1 0.1 0.1 0.1	0.05 0.11 0.5 1	00000000 0 0 00000000 0 0	20	<i>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</i>
	Unit	7/6w 7/6w 7/6w 7/6w 7/6w 7/6w 7/6w 7/6w	7/6n 1/6n 1/6n 1/6n 1/6n	mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB mg/kg DB	mg/kg DB % DB	ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB ug/kg DB
.e or	Flag	222222	22222	בב בב	D D	22222222
Sample No. Lab Sample No Matrix Assoc Sample()	Test Resul:	0.2 0.002 0.11 0.01 0.11	COMPOUNDS 0.05 0.1 0.5 1 1 1 1	0.55 0.15 0.05 0.05 0.05 0.05 0.05 0.05	20	<i>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</i>
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		EP TOXICITY METALS Arsenic Selenium Mercury Silver Cadmium Lead Chromium Barium	EP TOXICITY PESTICIDE/HERBICIDE COMPO Gamma-BHC (Lindane) Endrin Methoxychlor Toxaphene 2,4.5	INORGANICS Antimony Thatlium Lead Arsenic Selenium Mercury Silver Copper Beryllium Nickel Cadmium Chromium	TPH OIL & GREASE TOTAL ORGANIC CARBON	VOLATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethene 1,1-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene
			E-52			

8K3-20 15928-120 SOIL EB-11, TB-6, FB-2	717	<u> </u>	23322333333333333333333333333333333333
	Unit	19/kg DB 19/	
e Ko Ple	Flag		*
Sample No. Lab Sample No Matrix Assoc Sample()	Test Result	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, <u>888888888888888888888888888888888888</u>
BK3-5 15928-119 S( L EC-11, TB-6, FB-2	710	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	* *************************************
	g Unit	49/kg DB 49/	
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Sample No. Lab Sample No Matrix Assoc Sample(	Test Result	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	* ************************************
BK3-0.5 15928-118 SOIL EB-11, TB-6, FB-2	717	ภ ม ม ม ม ม ม ม ม ม ม ม ม ม ม ม ม ม ม ม	2
	9 Unit	ug/kg 08	
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Sample No. Lab Sample Matrix Assoc Sample	Test Result	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	2
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		Chloroform 1,2-Dichloroethane 2-Butanane 1,1,1-Trichloroethane Carbon Tetrachloride Vinyl Acetate Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropene Trichloroethene Dibromochloromethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane Benzene trans-1,3-Dichloropropene Bromoform 4-Methyl-2-Pentanone 2-Hexanone Tetrachloroethene 1,1,2,2-Tetrachloroethane Tolluene Chlorobenzene Ethylbenzene Ethylbenzene Ethylbenzene Syrene	SEMI-VOLATILES (BY GC/MS) Phenol Bis(2-chloroethyl)ether 2-chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene 2-Methylchenol Bis(2-chlorospropyl)ether 4-Methylchenol Bis(2-chloroethane Natrobenzene Isophorone 2-Nitrophenol Benzoic Acid Benzoic Acid Bis(2-chloroethoxy)methane 2,4-Dimethylchenol Benzoic Acid Bis(2-chloroethoxy)methane 2,4-Dimethylchenol Benzoic Acid Bis(2-chloroethoxy)methane 2,4-Dimethylchenol Benzoic Acid Ben

Sample No. : BK3-20 Lab Sample No : 15928-120 Matrix : 501L Assoc Sample() : EB-11, TB-6, FB-2 Result Flag Unit LLD	38	
Sample No. : BK3-5 Lab Sample No : 15928-119 Matrix : SOIL Assoc Sample() : EB-11, TB-6, FB-2 Test Flag Unit LLD	35 U ug/kg DB 70 70 U ug/kg DB 70 35 U ug/kg DB 70 35 U ug/kg DB 35 35 U ug/kg DB 35 36 U ug/kg DB 35 37 U ug/kg DB 35 38 U ug/kg DB 35 39 U ug/kg DB 35 30 U ug/kg DB 35 30 U ug/kg DB 35 31 U ug/kg DB 35 32 U ug/kg DB 35 33 U ug/kg DB 35 34 U ug/kg DB 35 35 U ug/kg DB 35 36 U ug/kg DB 35 37 U ug/kg DB 35 38 U ug/kg DB 35 39 U ug/kg DB 35 30 U ug/kg D	
Sample No. : BK3-0.5 Lab Sample No : 15928-118 Matrix : SOIL Assoc Sample() : EB-11, TB-6, FB-2 Test Flag Unit LLD	39 U ug/kg DB 777 U u	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-789-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	2-Methylnapthalene Hexachiorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronapthalene 2,6-Dinitroaniline Acenaphthene 2,6-Dinitrophenol Dibenzofuran 2,4-Dinitrophenol Dibenzofuran 2,4-Dinitrophenol Jethylphthalate 2,6-Dinitrophenol Jethylphthalate 3-Nitroaniline 4-Nitroaniline 4-Nitroaniline 4-Nitroaniline 4-Nitroaniline 6,6-Dinitro-2-Methylphenol N-Nitrosodiphenylemine(1) 4-Bromophenyl-phenylether Hexachlorophenol Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Benzoclananthracene Chrysene Burylbenzylphthalate Burylbenzylphthalate Burylbenzylphthalate Burylbenzylphthalate Burylbenzylphthalate Burylbenzylphthalate Burylbenzylphthalate Benzoclananthene Benzoclananthene Benzoclananthene Benzoclananthene Benzoclananthene Benzoclananthacene Dibenzoca, h)anthracene Benzoclananthacene Benzoclananthacene Benzoclananthacene	

(1) Cannot be separated from biphenylamine

MJ1-4(D) 15928-34 15928-34 14ATER EB-12, FB-2	, , , , , , , , , , , , , ,	0.5	
<u> </u>	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	ng/L	7/6n n n 7/6n n 1/6n n 1/6n n 1/6n n 1/6n n n n n n n n n n n n n n n n n n n
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test	######################################	2.3	
MU1-4 15928-33 WATER EB-12, 'B-7, 'B-2	88-889	0.5	MM
<u>2</u>	7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1	n9/L	7/65
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U	17 17 17 17 17 17 17 17 17 17 17 17 17 1	. 3.3	
Mu1-3 15928-32 15928-32 1401ER EB-12, FB-2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.5	
<u>2</u> ,	7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1	1/6n	7/6n n n 1/6n n n n n 1/6n n n n n n 1/6n n n n n n n n n n n n n n n n n n n
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	1.4	е е е м е м е е е е е м е м е е е е м е м е м е м е м е м е м е е е е е
15928-31 15928-31 1ATER 12, 112, 18-7, 18-2	0,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,000,0000	0.5	
e No. : H pole(s) : E Flag Unit	7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1	ng/L	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	ก ระ0	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	HORGANICS Dissolved Antimony Dissolved Thallium Dissolved Lead Dissolved Arsenic Dissolved Selenium Total Mercury Dissolved Silver Dissolved Silver Dissolved Beryllium Dissolved Beryllium Dissolved Copper Dissolved Copper	TPH OIL & GREASE	Chloromethane Eromomethane Bromomethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Butanone 1,1,1-Trichloroethane Carbon Tetrachloride Vinyl Acetate Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropane Trichloroethane Dibromochloromethane 1,2-Dichloropropane 1,2-Dichloropropane Cis-1,3-Dichloropropane Trichloroethane Bromodichloromethane 1,1,2-Trichloroethane Bromoform Cis-1,3-Dichloropropene Trichloroethane Bromoform Cis-1,2-Trichloroethane 1,1,2-Trichloroethane Bromoform Chloroethane Trans-1,3-dichloropropene Trans-1,3-dichloroethane 1,1,2-Trichloroethane Sromoform Chlorobenzene Tetrachloroethane Tetrachloroethane Tetrachloroethane Totume Chlorobenzene Styrene

Sample No. : MW1-4(D) Lab Sample No. : 15928-34 Matrix : WATER Assoc Sample(s) : EB-12, 18-7, FB-2	Test Result Flag Unit LLD	NT U ug/L , NT	NT U UG/L NT	N	n ng/r	n ug/L	NI U UG/L NI	J/6n n	7/6n n 1	NI U UG/L NI	U ug/L	<b>=</b> =	NT U ug/L NT	U ug/L	NI U U9/L NI	N U U9/L	<b>&gt;</b> :	NI U UG/L NI	<b>&gt;</b>	<b>&gt;</b> :	או סיפור או	) <b>:</b>	N 1/60 0 1N	<b>-</b> -	1/6n n IN	N C CO/L NI	<b>5</b>	NI U U9/L NI	U ug/L	U ug/L	NI U US/L NI	NT U UG/L NT	<b>ɔ</b> :	NI U U9/L NI	<b>,</b>	<b>5</b>	<b>ɔ</b> :	NT U UG/L NI	) <b>=</b>	NI O UG/L
: MV1-4 : 15928-33 : WATER s) : EB-12, FB-2,	Flag Unit LLD	U ug/L 2	U ug/L 2	0 09/L 2			U ug/L 2		ug/L 2			0 ug/L 2	ug/r ug/L	U ug/L 51		0 ug/L 2		U ug/L 2			0 ug/L 4		U ug/L 2		ug/L	U Ug/L 4				ug/L		1/6n	ng/L	U ug/L 21	7/60 14/1	ng/L	U ug/L 21		1/50 100/L	
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result F	7	~	v ~	101	~ .	70	10	~ ~	<b>u</b> 4	2	~ ~	7	57	7 4	10	20	7	14	•	<b>3</b> ×	14	7	<b>4</b> W	101	<b>7</b> [	10	2,5	}	7 (	<b>,</b> ,	. ~	4	23	u 4	4	۲,	~ ~	10	13
Sample No. : Mul-3 Lab Sample No. : 15928-32 Matrix : UAIER Assoc Sample(s) : EB-12, FB-2	Test Result Flag Unit LLD	2 U ug/L 2	2 U ug/L 2	2 U U9/L 2	2 0 ug/L 2		2 0 ug/L 2	2 0 ug/t 2	2 U ug/L 2	7/6n 0 7	2 U ug/L 2	<b>&gt;</b> =	u ug/L	n ng/L	1/5n n	2 0 ug/t 2	;	<b>=</b> =	<b>,</b>	:		7/6n n 7	U ug/L	2 U ug/L 4	n ng/r	U U9/L	)	1, ug/L	ug/L	U vg/L	U ug/L	ug/L	U ug/L	1/6n n	<b>&gt;</b> =	1/5n n	U ug/L		=	20 ug/L 2
Sample No. : MW1-1 Lab Sample No. : 15928-31 Matrix : WATER Assoc Sample(s) : EB-12, FB-2	Test Result Flag Unit LLD		<b>-</b> =	1 ng/L	n ug/L	u ug/L	NI U UG/L NI	<b>&gt; &gt;</b>	n ng/L	N O 09/L NI	2	N 10 19/2 NT	<b>)</b>	U ug/L	NI UG/L NI	1/6n n	U ug/L	N C CO/L NT	<b>-</b>	U ug/L	1/6n n	N 0 09/L NI	U ug/L	1/6/L	u ug/L	NT U Ug/L NT	n ug/L		0 ug/t	U ug/L		u ug/r	U ug/L	⊃:	N U UG/L NI	n nd/L	U ug/L	U ug/L	7/60	N 1 0 03/C NI
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		SEMI-VOLATILES (BY GC/MS) Phenol	Bis(2-chloroethyl)ether	Z-Lniorophenoi 1 Z-Dichloropenzene	1,4-Dichlorobenzene	Benzyl alcohol	1,2-Dichlorobenzene	Bis(2-chloroisopropyl)ether	4-Methylphenol	N-Nitroso-di-n-propylamine Hexachloroethane	Nitrobenzene	Isophorone	2.4-Dimethylphenol	Benzoic Acid	Bis(2-chloroethoxy)methane	2,4-Dichorophenot 1,2,4-Trichlorobenzene	Napthalene	4-Chloroaniline	Kexachiorodianiene 4-Chloro-3-methylchenol	2-Methylnapthalene	Hexachlorocyclopentadiene	2,4,6-1richlorophenol	2-Chloronapthalene	2-Nitroaniline	Acenaphthylene	2,6-Dinitrotoluene	S-Millioning Acenaphthene	2,4-Dinitrophenol	4-Nitrophenol Dibenzofuran	2,4-Dinitrotoluene	Diethyl phthalate	4-Unlorophenyl phenylether Fluorene	4-Nitroaniline	4,6-Dinitro-2-Methylphenol	N-Nitrosodiphenylamine(1)	Hexach probensene	Pentachlorophenol	Phenanthrene	Anthracene	UI-n-Duty(phthalate Fluoranthene

: MU1-4(D) : 15928-34 : UATER : EB-12, TB-7, FB-2		ug/L 5 ug/L 1 mg/L 5 mg/L 5 mg/L 1 mg/L 1 mg/L 1 mg/L 1 mg/L 2 mg/L 2 mg/L 2
. e No. : : pte(s) : Flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ug/r ng/r ng/r ng/r ng/r ng/r ng/r ng/r n
o. Ie Nc Iple(		
Sample No. Lab Sample No. Matrix Assoc Sample(s' Test Result Flag L	************	
MU1-4 15928-33 WATER WATER 18-7, FB-2	00 <mark>0</mark> 0000444444	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	ug/L ug/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L
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mple Samp	405007044444	1111111111111
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag L		
MU1-3 15928-32 WATER WATER EB-12, FB-2, FB-2	00 <mark>0</mark> 0000044444	0 8-888-1-9-19-18-18-18-18-18-18-18-18-18-18-18-18-18-
	<b></b>	ug/L ug/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L m
oe No. : pple(s) : Flag Unit	7/5n 1 1/5n 1 1/5n 1 1/5n 2 1/5n 3 1/5n 1 1/5n 1 1/5n 1 1/5n 1	
No. ple A ample	20-12-20-20-20-20-20-20-20-20-20-20-20-20-20	200000000000000000000000000000000000000
Sample No. Lab Sample No. Matrix Assoc Sample(s' Test Result Flag L	2012/74/2009	. 5600 2000 160 33 34 340 340 420 420 420 420 420 420 420 420 420 4
MU1-1 15928-31 WATER WATER EB-12, FB-2	***************************************	0 2-222-14-14-14-14-14-14-14-14-14-14-14-14-14-
	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ug/L ug/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L m
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Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U		37 2100 2100 . 12 83 17 50 15 52 460 420 420 420 420 420 420 420 420 420 42
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1939	Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene Bis(2-ethylhexyl)phthalate Di-n-octyl phthalate Benzo(b)flouranthene Benzo(b)flouranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h,i)anthracene Benzo(a,h,i)aperylene	OTHER INORGANICS Dissolved from diphenylamine Dissolved from diphenylamine Dissolved Manganese Dissolved Manganese Dissolved Calcium Dissolved Calcium Dissolved Calcium Sulfate Chloride Nitrate Nitrate Total Dissolved Solids Total Suspended Solids Total Alkalinity Bicarbonate Alkalinity Carbonate Alkalinity DH

: MV1-4(D) : 15928-34R : UATER : EB-12, FB-2, it LLD		7	، ب	، د	N (	، د	ر ا	2	٠,	7:	J (										7					'ر 2	,,					2																				~ .			
s. : (s) :		7/gs	7/gs	7,65	7 7 7	9	7/gn	7) 1/5	7 7	9	1,6	765	9	, ,	9	3	9	1/6n	-T/Gn	789	<b>1</b> /6n	ng/r	ng/L	7/6n	1/6n	ug/L	1/6n	ng/L	ng/F	ng/F	9	7/6n	ug/L	760	9 3	66	7/65	g g	uq/L	9	7/6n	J/6n	ng/F	3	ng/r	ng/r	7/6n	કુ	ng/L	√L ng/L	1/6n	7/gn	/gn	ğ	
o. le No. mple(s Flag		<b>-</b>	<b>&gt;</b> :	<b>-</b> :	<b>:</b>	<b>-</b> :	_	<b>&gt;</b> :	<b>-</b> :	<b>-</b> :	<b>:</b>	<b>-</b>	ם כ	<b>3</b>	) =	•	:	<b>-</b> :			_		>	-	~		_	_	9		<b>:</b>			<b>-</b> :		=		7	· =	_	⊃		_	_		_		_		>	_			_	
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MU1-4 15928-33RE WATER WATER E8-12, F8-2																																																							
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MV1-3 15928-32RE WATER WATER 118-7, FB-2																																																							
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MU1-1 15928-31RE WATER LEB-12, FB-2, FB-2																																																							
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Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U																																																							
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	SEMI-VOLATILES (BY GC/MS)	-	Bis(2-chloroethyl)ether	2-Chlorophenol	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Benzyl alcohol	1,2-Dichlorobenzene	2-Methylphenol	2-chloroisopropyl)ether	4-Methylphenol	N-Nitroso-di-n-propylamine	Hexachloroethane	Nitrobenzene	Isophorone	Z-Ni trophenol	2,4-Dimethy[phenol	Benzoic Acid	8is(2-chloroethoxy)methane	2.4-Dichorophenol	+-Irichlorobenzene	Napthalene	4-Chloroaniline	Hexachlorobutadiene	4-Chloro-3-methytchenol	2-Methylnapthalene	Hexachlorocyclopentadiene	5-Trichlorophenol	2,4,5-Trichlorophenol	loronapthalene	2-Nitroaniline	Dimethyl phthalate	aphthylene	2,6-Dinitrotoluene	troaniline	Acenaphthene	2, - Dinitrophenol	4-Nitrophenol	Ulbenzoruran 3 / - 6 initanton	Z,4-Dinitiototame	lige primarate	Fluorene	C. Cool cine 6-Witroaniline	4 A-Dinitro-2-Methylphenol	N-Nitrosodiohenvlamine(1)	4-Rromonhenyl phenylether	Hexachlorobenzene	Pentachlorophenol	Phenanthrene	Anthracene	Di-n-butylphthalate	Fluoranthene	Je	Butylbenzylphthalate	
SAIC IR SAIC Pr Lab Ana RI Data	SEMI-VO	Phenol	Bis(	2-c	٦,	1,4-	Benz	1,2-	2- <b>K</b> e	Bis(	4-He	Ž	неха	Z .	dosi	N-2	2,4-	Benz	8is(	2.4-	1.2	Napt	7-7-Y	Hexa	4-Ch	7-7	Hexa	2.4.	2.4	2-Ch	2-Ni	Dime	Acen	5,6-	3-K	Acen	7	1N-5	200	7,7	ָּבְיבָּיבְיבָּיבְיבָּיבְיבָיבְיבָיבְיבָיבְיבָיבְיבְיבְיבְיבְיבְיבְיבְיבְיבְיבְיבְיבְי	1	in-7	7	) Z	4-8r	Hexa	Pent	Phen	Anth	n-i0	Fluo	Pyrene	Buty	

Sample No. : M41-4(D) Lab Sample No. : 15928-34RE Matrix : WATER Assoc Sample(s) : EB-12, FB-7,	Test Result Flag Unit LLD	20 U ug/L 20	5 n ng/r , 5	2 n ng/r 2	17 8 ug/L 2	2 n ng/L 2	7 1/6n n 7	7 1/6n n 7	ታ ገ/6n ብ ታ	7 7/6n n 7	7 1/6n n 7	у 7/5n л у
: Mu1-4 : 15928-33RE : WATER : E8-12, TB-7, FB-2	ררם	g/L NI	NI U ug/L NI	NT U ug/L NT	NT U ug/L NT	NT U ug/L NT	NT U ug/L NT	>	⊃	_	>	<b>5</b>
. : : MU1-3 E No. : 15928-32RE : WATER ole(s) : EB-12, FB-2	Unit LLD	U ug/L NT	U ug/L NT	U ug/L NT	U ug/L NT	U ug/L NT	U ug/L	U ug/L	n ng/L	U ug/L	U ug/L	
Sa Ha As	Test Result Flag Unit LLD	21 U ug/L 21	2 U ug/L 2	2 U ug/L 2	5 B ug/L 2	2 U ug/L 2	7/6n n 7	7 n n3/r	7 7/6n n 7	7 7/6n n 7	7 1/6n n 7	7 7/6n n 7
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		3.3'-Dichlorobenzidine	Benzo(a)anthracene	Chrysene	Bis(2-ethylhexyl)phthalate	Di-n-octyl phthalate	Benzo(b)flouranthene	Benzo(k)flouranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a.h)anthracene	Benzo(g,h,i)perylene

(1) Cannot be separated from diphenylamine

\$ 25 T

MU1-8 MA728-38 WATER EB-12, TB-7, FB-2		9.5	
e No. : ple(s) : Flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ng/L	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result flag U		1.1	
MU1-7 15928-37 WATER WATER 18-12, FB-2, FB-2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.5	
<del></del>	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 1/6n 1/6n 1/6n 1/6n	ng/L	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
o. Ile No mple( Flag	1		
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U		9.0	
MU1-6 15928-36 15928-36 1592 FB-12, 18-7, 18-2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.5	M-WMMMMM
<u>2</u>	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ng/L	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n
e No. ple(s Flag	, <b>3</b>	5	
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U	NAME OF STREET O	0.5	
MU1-5 15928-35 15928-35 15928-35 18-7, 18-7, 18-2	0 8 8 4 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	0.5	M-WMMMMMMM
e No. : ple(s) : Flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ug/L	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n
e No. ole(s	<b>5</b>	<b>¬</b>	
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U	######################################	0.5	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	INORGANICS Dissolved Antimony Dissolved Thallium Dissolved Lead Dissolved Arsenic Dissolved Selenium Total Mercury Dissolved Copper Dissolved Repyllium Dissolved Beryllium Dissolved Copper Dissolved Comium Dissolved Chromium	TPH OIL & GREASE	Chloromethane Chloromethane Bronomethane Chloroethane Winyl Chloride Chloroethane Methylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethane 1,2-Dichloroethane 2-Butancne 1,1,1-Trichloroethane 2-Butancne 1,1,1-Trichloroethane 2-Butancne 1,2-Dichloroethane 2-Butancne 1,2-Dichloroethane 2-Butancne 1,1,1-Trichloroethane 1,2-Dichloropropane Cis-1,3-Dichloropropane Trichloroethane 1,2-Dichloropropane Trichloroethane 1,2-Dichloropropane Trichloroethane 1,2-Trichloroethane 2-Hexancne Trichloroethane 1,1,2-2-Tentanone 2-Hexancne Tearachloroethane Chlorobenzene Ethylbenzene Styrene Styrene

MU1-8 15928-38 WATER EB-12, TB-7,	110	ดนดนดนดนดนนนนานาน _{นี้} นานานนนานานานานนา <mark>ธิด22</mark> นานนนนา‱นาร _ี นาน
	Flag Unit	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	00000000000000000000000000000000000000
HU1-7 15928-37 WATER EB-12, TB-7,	110	ดดดดดดดดดดดลดดนกพื้นนอนนอนนนนนนนอนนอนนียนนอนนอนนียนนนียน
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MU1-6 15928-36 WATER E8-12, F8-2	110	
	Flag Unit	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n
e Ko		
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	
: MV1-5 : 15928-35 : WATER : E8-12, F8-2,	770	ดดดดดดดดดดดนาดนาดหนานาดนาดนานานานานานานา
	Flag Unit	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	
SAIC IRP Project - Joe Foss Field S SAIC Project No. 01-827-03-769-22 L. Lab Analysis by Laucks Testing Labs M RI Data April-May 1989		Phenol Bis(2-chloroethyl)ether 2-chlorophenol 1,3-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene Bis(2-chloroisopropyl)ether 4-Methylphenol Nitroso-di-n-propylamine Hxachloroethane Nitrobenzene Isophorone 2-Nitrophenol 2,4-Dichloroethaylmenol 2,4-Dichloroethaylmenol 2,4-Dichloroethaylmenol 2,4-Dichloroethaylmenol 2,4-Dichloroethacl 1,2,4-Trichlorophenol 2,4-Dichloroethacl 2,4-Dichloroethacl 2,4-Dichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2,4,5-Trichlorophenol 2,4-Dinitrotoluene 3-Nitroaniline Dimethyl phthalate Acenaphthylene 2,5-Dinitrotoluene 3-Nitroaniline Acenaphthylene 2,4-Dinitrotoluene 3-Nitroaniline Acenaphthylene 2,4-Dinitrotoluene 3-Nitroaniline 4-Nitroaniline 4-Nitrophenol N-Nitrosodiphenyl phenylether Fluorene 4-Dinitrotoluene Diethyl phthalate 4-Dinitrotoluene Diethyl phthalate 4-Dinitrobenzene Acenaphthyl phenylether Fluorene 4-Dinitrobenzene Bentachlorobenzene Pentachlorobenzene Pentachlorobenzene Pentachlorobenzene Pentachlorobenzene Pentachlorobenzene Pentachlorobenzene Di-n-butylphthalate

Sample No. : MW1-8 Lab Sample No. : 15928-38 Matrix : WATER Assoc Sample(s) : EB-12, FB-7, FB-2 Test Result Flag Unit LLD	7 1/6n 0 7 7 1/6n	NY U ug/L 5 NY U ug/L 1 NY U ug/L 1 NY U mg/L 5 NY U mg/L 1 NY U mg/L 2
MH1-7 Sample 15928-37 Lab Sam WATER Matrix E812, Assoc 5 18-7, Test LLD Result	ดด <mark>⊏</mark> ทดทด44444	0 8-88899884
Sample No. : M Lab Sample No. : 11 Matrix : W Assoc Sample(s) : E Test Result Flag Unit	21 0 09/L 21 0 09/L 22 0 09/L 23 0 09/L 24 0 09/L 25 0 09/L 26 0 09/L 26 0 09/L 27 0 09/L 28 0 0	NT U UG/L NT U UG/L NT U UG/L NT U MG/L
Sample No. : Mul-6 Lab Sample No. : 15928-36 Matrix : uArER Assoc Sample(s) : EB-12, FB-7, FB-7, FB-2 Result Flag Unit LLD	2 0 ug/L 2 21 0 ug/L 21 22 0 ug/L 21 2 0 ug/L 21 2 0 ug/L 2 2 0 ug/L 2 4 0 ug/L 2 7 ug/L 2 8 0 ug/L 2 8 0 ug/L 2 9 ug/L	NT U ug/L 1 NT U ug/L 1 NT U mg/L 5 NT U mg/L 5 NT U mg/L 1 NT U mg/L 2 NT U mg/L 2 NT U mg/L 2 NT U mg/L 2
Sample No. : MW1-5 Lab Sample No. : 15928-35 Hatrix : WATER Assoc Sample(s) : EB-12, FB-7, FB-2 Result Flag Unit LLD	2 U ug/L 2 21 U ug/L 21 2 U ug/L 21 2 U ug/L 2 3 U ug/L 2 4 U ug/L 2 4 U ug/L 4 4 U ug/L 4 6 U ug/L 4 6 U ug/L 4 6 U ug/L 4 7 U ug/L 4 6 U ug/L 4 6 U ug/L 4 7 U ug/L 4 7 U ug/L 4 8 U ug/L 4 9 U ug/L 4 0 U ug/L	NI U U9/L 15 NI U U9/L 15 NI U M9/L 15 NI U M9/L 15 NI U M9/L 11 NI U M9/L 12
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Pyrene  Butylbenzylphthalate 3,3'-Dichlorobenzidine 2,1 U u Benzo(a)anthracene 2,1 U u Chrysene Bis(2-ethylbexyl)phthalate 2,1 U u Bis(2-ethylbexyl)phthalate 2,1 U u Bis(2-ethylbexyl)phthalate 3,1 U u Benzo(b)flouranthene 4, U u Benzo(a)pyrene 1ndeno(1,2,3-cd)pyrene 4, U u Benzo(a)phrene 6, U u Benzo(a,h)anthracene 7, U u Benzo(a,h)anthracene 7, U u Chrysene 7, U Chrysene 7	OTHER INORGANICS  Dissolved Iron Dissolved Manganese Dissolved Sodium Dissolved Calcium Dissolved Magnesium Sulfate Chloride Mitrate Total Dissolved Solids Total Suspended Solids Total Atkalinity Bicarbonate Alkalinity Carbonate Alkalinity PH

MU1-8 15994-3 +E WATER E8-12, T8-7, F8-2	ררס	٥ ٨	~ ~	100	2 2	0 N	2 2	140	<b>,</b> 0	4 0	S.	V 4	~	<b>:</b> ~:	~	F (V)	4 4	. 4 c	44	~ ~	145	2 ∾	2,5	3~	40	1 ~	~ ~	<b>1</b> 2	۰ ۲	1 4	50	22	~	~ ~
 . G	Flag Un	2 U ug/L '				2 U ug/L 2 U ug/L	2 U ug/L	_	_	4 U ug/L	· > :		<b>&gt;</b> :	<b>)</b>	<b>&gt;</b> =	<b>)</b>	<b>&gt;</b> =	) <b>=</b> =	<b>-</b> -	<b>&gt;</b> =	1/6n n 5	<b>5</b>	1/6n n 0	<b>)</b>	<b>&gt;</b> =	<b>,</b>	<b>=</b> :		<b>&gt;</b> :		5		<b>-</b>	7/6n n 2/r
Sample No. Lab Sample No Matrix Assoc Sample(	Test Result	•									Ň											= ``	70.7	7				7 73			7			~ ~
MU1-7 15928-37PE WATER EB-12, IB-7, FB-2	t LLD	××	2 2	<b>X</b>	Z Z	¥ ¥	<b>2</b> 2	Z	žŻ	2 2	=	Z 'Z	=	Z Z	¥ 5	= =	<b>Z</b> 5	12 2	Ē	<u> </u>	<b>*</b>	ž	×	ZZ	Z	Ē	¥ :	ZZ	25	Z	Z	z z	H	ZZ
: No. : :	flag Un	U ug/L U ug/L	1/6n n	0 ug/L	0 mg/t 0 mg/r	7/6n n	U 49/L	1/6n n		7/6n n		1/6n n			1/6/1 0 ng/r		<b>&gt;</b> =	7/6n n	0 ug/t	U ug/L	0 mg/L	n ng/r		7/6n n	n ng/L			7/6n 0	_	0 09/L U u9/L	U ug/L	1/6n n	1/6n n	U ug/L U ug/L
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	M	XX	2	2 2	<b>7</b>	- X	7	2 2	F 2	<b>'</b>	Z 2	5	Z	TN 3	ē	Z 5	2	<b>Z Z</b>	2 3	5	ZZ	2	ZZ	25	ž	×	Z X	2	z	IN	<b>Z</b> Z	IN	N
MU1-6 15928-36RE WATER EB-12, TB-7, FB-2	1 110	00	~ ~	100	~ ~	<b>~~</b>	~ ~	140	77	<b>4</b> (	22.	7 4	. 7	<b>1</b> 0	~	* N	<b>4</b> 4	140	74	<b>~</b> ~	146	2 ~	22,	7 ~	40	<b>,</b> ~	2 -	7 5	۰۷;	<b>7</b>	21	~ ~	· ~	00
	Flag Unit	0 ug/t	7/6n n	u ug/L	7/6n n	1/6n n	0 ug/L	1/65 n	7/6n n	09/L	U ug/L	n 49/1	n ng/t	0 mg/r 0 mg/r	U ug/L	7/6n n	U ug/L	1/65 n	1 /6/1 0 /6/1	1 mg/L	n ng/L	7/8 0 7/8 0 0	0 mg/L	7/88 2 28 2 20	n ng/L	7/6n 0 n8/1	U ug/L	7/65 0	7/6n n	7/6n n	U ug/L	U ug/L	7/5n n	7/6n n
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	00	~ ~	101	~ ~	~~	<i>~</i> ~	141	<b>,</b> ,	40	25	7 7	. 0	1 00	~ ~	10	4 ×	141	V 4	200	14	2 ~	21.	7 2	40	v ~	~ ~	4.5	2	1 4	21.	~ ~	2 1	2.2
MU1-5 15928-35RE WATER EB-12, TB-7,	, 110	00	~~	10	~ ~	~~	~ ~	140	v ~	<b>4</b>	S	7 7	. 67	<b>*</b> ~	~ ~	* ~	<b>~</b> *	140	<b>7</b> 4	~ ~	149	2 ∾	28	<u></u> ~	<b>1 1 1</b>	<b>v</b> ~	~	<b>7</b> C	; ~·	<b>4</b> 4	20	~ ~	1 ~	77
	Flag Unit	ug/t ug/t	1/6n	1,6n	1/6n 1/6n	1/6n 18/1	1/6n	1/6 1/6	76n ng/r	u9/L	ug/L	1/6n	1/gn	49/L	ng/L	49/L	1/6n	7 69 17 5	1/6s 28/1	7/6n	1/6n	1/6n	1/6n	1/6n	ng/L	7/6n na/r	ng/L	1/6n	1,6p	7/6n	ug/L	ug/L	7/6n	1/6n
io. ole Re smple						<b>5</b> 5																												
Sample No. Lab Sample No. Hatrix Assoc Sample(s)	Test Result	1010		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				141	410	7 (1				3 14	10.						14	2 (	181	3.0	71	<b>V</b> (V		4 %	, (0	7 7	2	101	, (	88
SAIC IRP Project - Joe Foss Field S SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs H RI Data April-May 1989		SEMI-VOLAIILES (BT GL/MS) Phenol Bis(2-chloroethyl)ether	2-Chlorophenol	1,4-Dichlorobenzene	Benzyl alcohol 1,2-Dichlorobenzene	2-Methylphenol Bis(2-chloroisopropyl)eth	4-Methylphenol	Hexach oroethane	Nitropenzene Isophorone	2-Nitrophenol	Benzoic Acid	81s(2-chloroethoxy)methan 2 4-Dichorophool	1,2,4-Trichlorobenzene	Napthalene 4-Chloroaniline	Hexachlorobutadiene	4-Unloro-3-metnylphenol 2-Methylnapthalene	Hexachlorocyclopentadiene	2,4,5-Trichlorophenol	2-Chloronapthalene 2-Nitroaniline	Dimethyl phthalate	2,6-0 initrotoluene	3-Nitrosniine Acenaphthene	2,4-0 initrophenol	4-Nitrophenol Dibenzofuran	2,4-Dinitrotoluene	Diethyl phthalate 4-Chlorophenyl phenylethe	Fluorene	4-Nitroaniline	N-Nitrorodiphenylamine(1)	4-Bromophenyl phenylether	Pentachlorophenol	Phenanthrene	Oi-o-butylohthalate	Fluoranthene Pyrene

Sample No. : Mul-8 Lab Sample No. : 15928-38RE Matrix : LAMER Assoc Sample(s) : EB-12, FB-7, FB-2	Test	Result Flag Unit LLD	2 n ng/r 2	20 U ug/L · 20	2 n ng/L 2	2 U ug/L 2	2 B ug/L 2	2 n ng/L 2	7 7/6n n 7	7 7/8n n 7	7 7/8n n 7	7 7/6n n 7	7 7/6n n 7	7 7/6n n 7
Sample No. : MV1-7 Lab Sample No. : 15928-37RE   Matrix : WAIER   Assoc Sample(s) : E8-12, / F8-2	Test	Result Flag Unit LLD	NI U ug/L NI	NI U ug/L NI	NT U ug/L NT		NT U ug/L NT		_ _	N n ng/L NT	n ng/L	n ng/r	n ng/L	NT U ug/L NT
Sample No. : MW1-6 Lab Sample No. : 15928-36RE Matrix : WATER Assoc Sampie(s) : EB-12, FB-7,	Test	Result Flag Unit LLD	ˈ <b>ɔ</b>	21 U ug/L 21	2 c ng/t 2	2 U ug/L 2	12 ug/L 2	2 U ug/L 2	7/8n n 7	7 /6n n 7	7/6n n 7	7 1/6n n 7	7 n ng/L 7	7 1/6n n 5
Sample No. : MW1-5 Lab Sample No. : 15928-35RE Matrix : WATER Assoc Sample(s) : EB-12, FB-2	Test	Result Flag Unit LLD	2 U ug/L 2	20 U ug/L 20	2 U ug/L 2	2 U ug/L 2	3 8 ug/t 2	2 U ug/L 2	7 7/8n n 5	7 n n3/r	7 7/6n n 7	7 7/6n n 7	7 n ng/r 7	7 1/Bn n 7
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-766-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989				3.3'-Dichlorobenzidine		Chrysere	Bis(2-ethylhexyl)ohthalat	Di-n-octyl phthalate	Benzo(b) flouranthene			Dovrene		

(1) Cannot be separated from diphenylumine

MU1-12 15928-42 15928-42 168-12, 18-7, 18-2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9.5	M
<u></u>	7/6n 7/6n 7/6n 7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1	ng/L	7/6n n n n n n n 7/6n n n n n n n 7/6n n n n n n n 7/6n n n n n n n 1/6n n n n n n n n 1/6n n n n n n n n 1/6n n n n n n n 1/6n n n n n n n n n n n n n n n n n n n
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U	+ + + + + + + + + + + + + + + + + + +	2.2	200 170 170 170 170
MU1-11 15928-41 WATER EB-12, TB-7, FB-2	o พพะพพท่ะนะดนนะ	0.5	
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e No. : ple(s) : Flag Unit	Þ	Þ	
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U	N 1	. 0.5	
MW1-10 15928-40 WATER WATER 18-7, FB-2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.5	ееемемееееемеееемемеемеммемееее
٠ عَرِ	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ug/L	7/66 7/66 7/66 7/66 7/66 7/66 7/66 7/66
e No. : ple(s) : Flag Unit	ສ	<b>5</b>	
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U	N X X X X X X X X X X X X X X X X X X X	0.5	
MU1-9 15928-39 WATER EB-12, FB-7, FB-2	0 2 2 2 2 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4	0.5	
	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	ug/L	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
e No. : ple(s) : Flag Unit	3	Þ	
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U	44444444444444444444444444444444444444	0.5	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	INORGANICS Dissolved Antimony Dissolved Thallium Dissolved Lead Dissolved Arsenic Dissolved Arsenic Dissolved Selenium Total Mercury Dissolved Copper Dissolved Beryllium Dissolved Cadmium Dissolved Cadmium Dissolved Cadmium Dissolved Cadmium	TPH OIL & GREASE	VOLATILE ORGANICS (BY GC/MS) Chloromethane Brammethane Univ! Chloride Chloroethane Viny! Chloride Chloroethane 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Butanone 1,1-Trichloroethane 2-Butanone 1,1-Trichloroethane 1,2-Dichloropropane 1,1,2-Trichloroethane Benzene 1,1,2-Trichloroethane Benzene 1,1,2-Tetrachloroethane 1,1,2-Tetrachloroethane Ictrachloroethane Ictrachloroethane Ictrachloroethane Ictrachloroethane Ictrachloroethane Ictrachloroethane Ichlorobenzene Ethylbenzene Ichlorobenzene Ichlorobenzene Ichlorobenzene Ichloropenzene Ichlorobenzene Ichloropenzene Ichlorobenzene Ichloropenzene

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: MU1-1201L : 15928-42 : WATER : E8-12, F8-7,	it LLD .		ng/L	7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1
No.	flag Unit	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	S	
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Result FI	***************************************	TN.	^{សសស្តមស៊ីសសសសសសសសសសសសសសសសសសសសស}
MU1-11 15928-41 WATER EB-12, TB-7,	610	0 NN-NNGN	0.5	, 
	Flag Unit	7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1	ng/L	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Result Fl		i x	
M41-10 15928-40 MATER E8-12, T8-7, F8-2	ררס	o พพะพพต่ะแะตะเ	0.5	
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	lest Result Fl		TX.	
: Mu1-9 : 15928-39 : WATER : EB-12, : FB-2	ררס	0 พพะพพภ่ะนะดะนะ	0.5	
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A Me	Test Result Fl	***************************************	K	**************************************
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		INORGANICS Dissolved Antimony Dissolved Thallium Dissolved Lead Dissolved Arsenic Dissolved Selenium Total Mercury Dissolved Silver Dissolved Copper Dissolved Mickel Dissolved Reryllium Dissolved Cadmium Dissolved Cadmium Dissolved Cadmium Dissolved Chromium Dissolved Clromium	TPH O'L & GREASE	Chloromethane Bromomethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene 1,1-Dichloroethene 1,1-Dichloroethene 1,1-Dichloroethene 1,1-Dichloroethene 1,1-Dichloroethene 1,1-Dichloroethene 1,2-Dichloroethene 1,2-Dichloropropane Carbon Tetrachloride Vinyl Acetate Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloropropene Trichloroethene Dibromochloromethane 1,1-2-Trichloroethane Bromoform Frans-1,3-dichloroethane Bromoform 4-Methyl-2-Pentanone 2-Hexanone Tetrachloroethene 1,1,2-Z-Tetrachloroethane 1,1,2-Z-Tetrachloroethane Erhylbenzene Ethylbenzene Styrene

SHE for Prince, to. 0. 1927-93 (14.0 Sapele to. ) 1923-94 (14.0 Sapele to.	Mul·12 15928-42 WATER EB·12, TB-7, FB·2	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Sample No. : 1972-9. Sample No. : 1972-9. Cample No	n	
Sample No. 1 Mol-7 Sample No. 2 Mol-10 Sample No. 3 Mol-10 Sample No. 1 Mol-7 Sample No. 2 Mol-20 Sample N	No. le(S	
Sample No. : 1401-9   Sample No. : 1401-10   Sample No. : 157828-40   Liab Sample No. : 157828-4	Sample No. Lab Sample Matrix Assoc Samp Test Result	กทางการการการการการการการการการการการการการก
Sample No. : MHT-0   Sample No. : 1 WIT-10   Sample No. : 1 Sample	11-1 1928 1928 1-12 1-2	นทนทนทนทนานทาง ที่ พ.ศ. 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2
Sample No. : HWI-9   Sample No. : HWI-10   Lab Sample No.   Lab Sample No. : Lab Sample No. : HATER   Matrix Assoc Sample(s) : E8-12,   Matrix	<u>i</u>	<u> </u>
Sample No. : : : : : : : : : : : : : : : : : : :	No. e(s) Flag	
Sample No. : : W11-9	No. pole ampl	
Sample No. : HV1-9 Sample No. : HATER HARTIN	Sample Lab Sam Matrix Assoc S	20 4 70 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
Sample No. : HV1-9 Sample No. : HATER HARTIN	1-10 928-40 FER -12, -7, -2	
Sample No. : HW1-9	158 158 168 168 168 168 110	
Sample No. : 15928-39 Lab Sample No. Lab Sample No. : 15928-39 Lab Sample No. I 16928-39 Lab Sam	. (s	65 65 65 65 65 65 65 65 65 65 65 65 65 6
Sample No. : Mu1-9 Lab Sample No. : 15928-39 Hatrix : WATER Assoc Sample(s) : E8-12,  Test Result Flag Unit LLD 2 U ug/L 3 U ug/L 3 U ug/L 4 U ug/L 5 U ug/L 5 U ug/L 6 U ug/L 6 U ug/L 7 U ug/L	e No ppleC	
Assoc Sample No. ::  Assoc Sample (S) ::  Assoc Sample (S) ::  Fest  2 U ug/L  4 U ug/L  5 U ug/L  7 U ug/	Sample No Lab Sample Matrix Assoc San Test Result	นทนทนทนทนนนนนนนี้ผนนนนนนนนนนนนนนนนนธน <u>นนี้</u> นนนทนนนี้นนนั้นทนท
Assoc Sample No. ::  Assoc Sample (S) ::  Assoc Sample (S) ::  Fest  2 U ug/L  4 U ug/L  5 U ug/L  7 U ug/	41-9 5928-39 ATER 8-12, 8-7, 8-2	กทางการและ ราย 2 การการการการการการการการการการการการการก
Sample No. Lab Sample No. Hatrix Assoc Sample No. Hatrix Assoc Sample No. Sample No. Lest Result Flag C C C C C C C C C C C C C C C C C C C		
Sample Natrix Assoc Sample Natrix Assoc Sample Natrix Assoc Sample Natrix Test	No. Le(s Flag	
	No. mple Samp	000000000000040040040040444040004504504450445
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-766-22 Lab Analysis by Laucks Iesting Labs RI Data April-May 1989  RI Data April-May 1989  Bis(2-chlorophenol 1, 3-Dichlorobenzene Benzyl alcohol 1, 2-Dichlorobenzene Benzyl alcohol 1, 2-Dichlorobenzene Benzyl alcohol 1, 2-Dichlorobenzene Benzyl alcohol 1, 2-Dichlorobenzene Benzyl alcohol 2, 4-Nethylphenol Bis(2-chloroisopropylamine Hexachloroethane Nitrobenzene Isophorone 2, 4-Dichlorophenol 2, 4-Dimethylphenol 2, 4-Dimitrophenol 3-Nitroaniline Acenaphthene 2, 4-Dimitrophenol 2, 4-Dimitrophenol 2, 4-Dimitrophenol 3-Nitroaniline 4-Dimitrophenol 3-Nitroaniline 2, 4-Dimitrophenol 3-Nitroaniline 3-Ni		
	SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	SEMI-VOLATILES (BY GC/MS)  Phenol Bis(2-chlorophenol 1,3-bichlorobenzene 1,4-bichlorobenzene 1,4-bichlorobenzene 2-bichlorobenzene 2-bichlorobenzene 2-bichlorobenzene 2-bichlorobenzene 3-bichlorobenzene 3-bichlorophenol 3-4-bichlorocthane 3-bichlorophenol 2,4-bimethylphenol 3-4-bimethylphenol 3-4-bimethylphenol 3-4-bimethylphenol 3-4-bimethylphenol 3-4-bimethylphenol 3-4-frichlorophenol 3-6-finitrocoluene 3-Nitrophenol 3-Nitrophenol 3-Nitrophenol 3-6-finitrocoluene 3-8-finitrocoluene 3-8-finitrocoluene 3-8-finitrocoluene 3-8-finitrocoluene 3-8-finitrocoluene 3-8-finitroco

. : MW1-12 e No. : 15928-42RE sle(s) : E8-12, T8-7, Flag Unit LLD	N   N   N   N   N   N   N   N   N   N	
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U		
: MV1-11 : 15928-41RE : UATER : EB-12, FB-2, fB-2		
e No. : ple(s) : Flag Uni	7/6n n n n n n n n n n n n n n n n n n n	
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag I		
MU1-10 15928-40RE WATER LB-12, FB-2, FB-2		
: : Jait	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	
Sample No. Lab Sample No. Marrix Assoc Sample(s) Test Result Flag (	000000000000000000000000000000000000000	
– 2 •		
MU1-9 15928-39RE MATER E8-12, F8-7, F8-2	กกกกกระบาย ราย เราะบาย เกาะบาย	
: No. : ble(s) :	7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1	
io. Ite Kk mple(		
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag L	กนทบททบททบทนนนนนนนนนนนนนนนนนนนนนนนนนนนน	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Semi-Vulliles (si uc/As) Phenol Bis(2-chlorophenol 1,3-Dichiorobenzene 2-thiorophenol 1,2-Dichiorobenzene 2-Methylphenol N. Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene 2,4-Dinethylphenol Bis(2-chlorophenol Nitrobenzene 1.2,4-Trichlorophenol 1,2,4-Trichlorophenol 1,2,4-Trichlorophenol 2,4,6-Trichlorophenol 3-Nitroaniline Acenaphthene 2,6-Dinitrotoluene 3-Nitroaniline 2,6-Dinitrotoluene 3-Nitroaniline 3-Nitroaniline 4-Nitroaniline 4-Nitroaniline 4-Nitroaniline 4-Nitroaniline 4-Nitroaniline 4-Nitroaniline 4-Nitroaniline 5,0-Dinitrotoluene 5,0-Dinitrotoluene 5,0-Dinitrotoluene 5,0-Dinitrotoluene 5,0-Dinitro-2-Methylphenol N-Nitroaniline 4-Nitroaniline 4-Nitroaniline 5,0-Dinitro-2-Methylphenol N-Nitrosodiphenyleher Fluorene 4-Nitroaniline 5,0-Dinitro-2-Methylphenol N-Nitrosodiphenyleher Fluorene 5-Dinitro-2-Methylphenol N-Nitrosodiphenol	

MU1-12	15928-42RE	WATER	EB-12,	TB-7, FB-2	1	770	IN IN	×	ī	TX.	K	X				Z		Ħ
••	••	••	 			Unit	ug/L	T/6n	ug/t	<b>1/6</b> 0	ng/L	ng/L	7/gn	1/gn	7/gn	ng/L	1/6n n	ng/L
	e No		ple(			Flag	ם	<u> </u>	Þ	<b>-</b>	<b>=</b>	<b>-</b>	<u>ت</u>	<b>&gt;</b>	<b>-</b>	D	<b>=</b>	<b>&gt;</b>
Sample No	Lab Sample No.	Matrix	Assoc Sar		Test	Result	æ	<del>-</del>	Ī	<b>\(\frac{1}{2}\)</b>	2	<b>=</b>	<del>-</del>	X	=	<b>\bar{\bar{\bar{\bar{\bar{\bar{\bar{</b>	<b>\(\frac{1}{2}\)</b>	Ī
-	-41RE					_	7	25	~	~	~	7	4	4	4	4	4	4
HW1-1	15928	WATER	EB-12	TB-7, FB-2	3	=======================================												
**	••	••	**					ng/L	J/gn	ng/L	<b>1/8</b> 2	7/6n	J/Bn	ng/L	J/go	ng/L	√L Mg/L	7∕6n
	e No.		ple(			Flag	<b>ٔ</b> ב	⊃	>	>	<b>0</b> 0	>	5	5	<b>-</b>	Þ	2	<b>5</b>
ole Mc	Lab Sample No.	×.	S San		est	Result	~	25	7	~	17	2	4	4	4	4	4	4
Samo	Lab	Matr	Asso		-	æ												
	ORE						a	_	a	~	~	~		·		•		
MU1-10	928-4	TER	-12,	T8-7, FR-2	ı	110		7					•	•	•	•	•	•
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	ġ.		(s)			Flag Un	ָר פֿק	, ug,	J. C.	,gu (	8	, gu	ב פ	5	, E	55	J/gn r	3
No.	ple		Sample				~	-	~	7	82	~	7	7	7	7	٠ ٧	7
ample	b Sar	trix	Assoc Sample(s)		Test	Result		•••			7							
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	.39RE		_			_	~	20	~	~	~	~	4	4	4	4	4	4
4V1-9	15928	AATER	8-12	TB-7, 58-2	3	Ξ												
						Unit	1/br	7/br	7/60	7/Br	7/5	J/Br	1/6	7/50	7/5	7/50	1/6n n 4	7/Br
	No.		Assoc Sample(s)			Flag	֖֖֖֝ ב	<b>5</b>	5	- =	8	5	- -	<b>-</b>	- -	<b>-</b>	5	b
e No.	ample	×	Samp		Test	12	2	20	~	~	~	~	4	4	4	4	4	4
Sampl	Lab Sample No.	Matri	Assoc		ē	Res												
ט	Ņ	aps																
Fiel	2-691	ing L	II								te							
Foss	7-03	Test	_				ė	line			Bis(2-ethylhexyl)phthalate	به	ğ	ų		ene	ene	ā
- Joe	01-82	aucks	1989				halat	3,3'-Dichlorobenzidine	cene		VLDD	Di-n-octyl phthalate	Benzo(b)flouranthene	Benzo(k)flouranthene		Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene
ject	No.	β	L-Hay				ylpht	lorob	Benzo(a)anthracene		Vlhex	Ę	loura	toura	Benzo(a)pyrene	2.3-c	, h) an	
Pro	ject	ysis	Apri				benz	·Dich	o(a)a	hrysene	2-eth	octy	(q)c	o(k)f	d(a)c	100	nzo(a	4,6)c
C IRE	SAIC Project No. 01-827-03-769-22	Ana	RI Data April-May 1989				Buty	3,3	Benze	Chry	Bisc	Di-n	Benze	Benze	Benze	Inde	Dibe	Benzı
SAI	SA	Lat	RI															

(1) Cannot be separated from diphenylamine

MU1-14 15928-19 WATER EB-12, FB-2, FB-2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.5	
	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ug/L	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n
e No. ple(s	, D	<b>5</b>	
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U	TXT- 0 X X X X X X X X X X X X X X X X X X	. 0.5	
MU1-13 15928-18 WATER EB-12, FB-2, FB-2	* 0 0 0 0 0 0	0.5	
S :: Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ug/L	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
e No ple(3	n 2	ם	
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U	7	0.5	
MU1-12D 15928-43 WATER EB-12, TB-7, FB-2	0 8 8 6 8 8 9 6 6 6 6 6 6 6 6 6 6 6 6 6 6	0.5	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
nit nit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ng/L	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n
e No ple(	<b>.</b>		222222222222222222222222222222222222222
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag U	7 1 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2.0	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1969	INORGANICS Dissolved Antimony Dissolved Thallium Dissolved Lead Dissolved Arsenic Dissolved Selenium Total Mercury Dissolved Silver Dissolved Beryllium Dissolved Nickel Dissolved Comium Dissolved Cadmium Dissolved Chromium Dissolved Chromium	TPH OIL & GREASE	VOLATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Butanone 1,1-Trichloroethane 2-Butanone 1,1-Trichloroethane 2-Butanone 1,1-Trichloroethane 2-Butanone 1,1-Dichloroethane 2-Butanone 1,1-Dichloropropene 1,2-Dichloropropene 1,2-Dichloropropene 1,2-Dichloropropene 1,2-Dichloropropene 1,2-Dichloropropene 1,2-Dichloroethane 2-Berzene 1,1-2-Trichloroethane Benzene 1,1-2-Trichloroethane 2-Hexanone 1,1-2-Trichloroethane Benzene 1,1-2-Tethloroethane 1,1-2-Tethloroethane 1,1-2-Tetrachloroethane Tetr-chloroethene

Flag Unit   LLD   Result   Flag Unit   LLD	SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Sample No. Lab Sample No. Matrix Assoc Sample(s)	MU1-12D 15928-43 WATER 168-12, 18-7, FB-2	Simple No. : Mul-13 Lab Sample No. : 15928-18 Matrix : WAFER Assoc Sample(s) : E8-12, F8-2	San Lab Mat Ass	
ether H 10 ug/L H 1 2 0 ug/L 2 2 2 0 ug/L 2				Unit	flag Unit	
Note	SEMI-VOLATILES (BY GC/MS)					
No.	Phenot	I/Sn U IN	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	2 U ug/L 2	n ng/L	
No.	Bis(Z-chloroethyl)ether	<b>&gt;</b> :		7 n n 2	1/6n n	
	1 3-Dichlosopene	=			0 ug/L	
March   Marc	1,4-Dichlorobenzene	<b>=</b>			1/80 11	
N. 10   105/11   N. 1   105/	Benzyl alcohol	<b>&gt;</b> =			n d/L	
N. 10 ug/L   N. 1	1,2-Dichlorobenzene	<b>-</b>		2 U ug/L 2	1/6n n	
N	2-Methylphenol	Þ			U ug/L	
N	Bis(2-chloroisopropyl)ether	<b>&gt;</b>			T/6n n	
N I I U U U U U U U U U U U U U U U U U	6-Methylphenol	<b>&gt;</b> :		2 U ug/L 2	1/6n n	
N	N-Nitroso-di-n-propylamine Hexachloroethane	<b>&gt;</b> =			7/8n n	
N	Nitrobenzene	) =			1 09/1	
N	Sophorone	<b>=</b>		2 U ug/L 2	0 0 0/L	
N	2-Nitrophenol	<b>-</b>		U ug/L	u ug/L	
N	2,4-Dimethylphenol	<b>5</b>		U ug/L	U ug/L	
N. 10   195/L   N. 17   2   10   195/L   2   2   10   195/L   N. 17   10   195/L   N. 17   N	Benzoic Acid	<b>&gt;</b>		U ug/L	U ug/L	
N   1   0   0   0   0   0   0   0   0   0	Bis(2-chloroethoxy)methane	⇒:		7/6n n	n ng/r	
NI	2,4-Ulchorophenol	<b>&gt;</b> =			760	
N   0   09/1	Naothal ene	=			2 m	
N	4-Chloroaniline	) <b>=</b>			1/6n n	
N	Hexachlorobutadiene	<b>-</b>		U ug/L	U ug/L	
MI U U U U U U U U U U U U U U U U U U U	4-Chloro-3-methylphenol	<b>&gt;</b>		n ng/L	n ng/L	
N	Z-Methylnapthalene	<b>&gt;</b> =		7/6n n	7/6n n	
N	nexacii or ocyclobeni adiene 2 & A-Trichlorophenol	<b>&gt;</b> =		7/60 11	1 ng/L	
NI   0   0g/L   NI   2   0   0g/L   2   2   0   0g/L   NI   0   0g/L   NI   NI   0   0g/L   NI   NI   0   0g/L   NI   NI   NI   NI   NI   NI   NI   N	2,4,5-Irichtorophenol	) )		U 49/L	U 49/L	
NT U ug/L NT	2-Chloronapthalene	5		U ug/L	U ug/L	
N	2-Nitroaniline	<b>&gt;</b> :		U ug/L	U ug/L	
NI   0   05/1   NI   1   05/1   NI   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0   05/1   0	Dimethyl phthalate	<b>&gt;</b> =		1/60 1 08/1	7/6n n	
NT   U ug/L	2.6-Dinitrotoluene	=		7/60	1/60 n	
NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L 2 2 U ug/L 2 0 ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L 2 2 U ug/L 2 0 ug/L 2 2 U ug/L 2 0 ug/L 2 2 U ug/L 2 U ug/L 2 U ug/L 2 U ug/L 2 2 U	3-Nitroaniline	)		U ug/L	U ug/L	
NT U ug/L NT 20 U ug/L 20 20 U ug/L 20 0 ug/	Acenaphthene	<b>&gt;</b>		U ug/L	U ug/L	
	2,4-Dinitrophenol	<b>-</b> :		. u ug/L	u ug/t	
bluene NT U ug/L NT 2 U ug/L 4 4 U ug/L 4 4 U ug/L 4 4 U ug/L NT U ug/L NT 2 U ug/L 2 0 ug/L 2 0 ug/L NT U ug/L NT 2 U ug/L 2 U ug/L 2 0 ug/L 2 0 ug/L NT U ug/L NT 2 U ug/L 4 4 U ug/L NT U ug/L NT 2 U ug/L 4 4 U ug/L NT U ug/L NT 2 U ug/L 4 4 U ug/L NT U ug/L NT 2 U ug/L 4 4 U ug/L NT U ug/L NT 2 U ug/L 4 4 U ug/L NT U ug/L 4 4 U ug/L NT U ug/L 4 4 U ug/L A 4 U ug/L NT U ug/L NT 2 U ug/L 4 4 U ug/L A 4 U ug/L NT U ug/L NT 2 U ug/L 4 4 U ug/L A 4 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L A 4 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT U ug/L 2 2 U ug/L 2 2 U ug/L NT U ug/L NT U ug/L 2 2 U ug/L 2 2 U ug/L NT U ug/L NT U ug/L 2 2 U ug/L 2 2 U ug/L 2 2 U ug/L NT U ug/L NT U ug/L NT U ug/L 2 U ug/L 2 2 U ug/L NT U ug/L N	4-Nitrophenol	<b>&gt;</b> =		0 ug/L	1 09/5	
wylether NT U ug/L NT 2 U ug/L 2 2 U ug/L 1 1 U ug/L NT 1 U ug/L NT 2 U ug/L 2 2 U ug/L 1 U ug/L NT 1 U ug/L NT 2 U ug/L 2 2 U ug/L 1 U ug/L NT 1 U ug/L NT 2 U ug/L 2 2 U ug/L 1 U ug/L NT 0 ug/L NT 2 U ug/L 2 2 U ug/L 2 2 U ug/L NT 0 ug/L NT 2 U ug/L 2 2 U ug/L 2 2 U ug/L NT 0 ug/L NT 2 U ug/L 2 2 U ug/L NT 0 ug/L NT 2 U ug/L 2 2 U ug/L NT 0 ug/L NT 2 U ug/L 2 2 U ug/L 2 2 U ug/L NT 0 ug/L NT 2 U ug/L 2 U ug/L 2 U ug/L 2 U ug/L 2 U ug/L 2 U ug/L 2 U ug/L 2 U ug/L 2 U ug/L 2 2 U u	2 A-Dinitrotoluese	> =		7,60	7/60 =	
inylether NT U ug/L NT 2 Û ug/L 2 2 U ug/L 2 U u	Diethyl phthalate	<b>&gt;</b> =		1/60 O	7/65 A	
NT   U   U   U   U   U   U   U   U   U	4-Chlorophenyl phenylether	>		ù ug/L	U ug/L	
hi U ug/L NI 20 U ug/L 20 20 U ug/L nr U ug/L NI 20 U ug/L 20 20 U ug/L nr U ug/L NI 20 U ug/L 20 20 U ug/L nr U ug/L NI U ug/L NI 4 U ug/L 4 4 U ug/L NI U ug/L NI 4 U ug/L 4 4 U ug/L NI U ug/L NI 20 U ug/L 20 20 U ug/L NI U ug/L NI 2 U ug/L 2 2 U ug/L NI U ug/L NI 2 U ug/L 2 2 U ug/L NI U ug/L NI 2 U ug/L 2 2 U ug/L NI U ug/L NI 2 U ug/L 2 2 U ug/L NI U ug/L NI 2 U ug/L 2 2 U ug/L NI U ug/L 2 U ug/L 2 U ug/L NI U ug/L NI U ug/L 2 U ug/L 2 2 U ug/L NI U ug/L NI U ug/L 2 U ug/L 2 2 U ug/L	Fluorene	⊃		U ug/L	1/6n n	
Priemot NI U UG/L NI 20 U UG/L 20 C U UG/L 4 U UG/L 7 U U	4-Nitroaniline	<b>&gt;</b> :		1/6n n	7/6n n	
Tether NT U ug/L NT 4 U ug/L 4 4 U ug/L NT NT U ug/L NT	4,6-Dinitro-Z-Metnylphenol	<b>&gt;</b> :		0 ug/t	1 ng/L	
NT U ug/L NT 20 U ug/L 2 20 U ug/L NT U ug/L NT U ug/L NT 20 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT	K-Nitrosodiphenylamine(1)	<b>=</b>		1 09/L	n na/L	
NT U ug/L NT 20 U ug/L 20 20 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L NT U ug/L NT 2 U ug/L 2 2 U ug/L		) >		1/6n n	n ug/L	
NT U UG/L NT 2 U UG/L 2 2 U UG/L NT U UG/L NT 2 U UG/L 2 2 U UG/L NT U UG/L 1 2 U UG/L 2 2 U UG/L NT U UG/L 1 2 U UG/L 2 2 U UG/L	Pentachlorophenol	>		U ug/L	n ng/L	
NI U UG/L NI 2 U UG/L 2 2 U UG/L NI U UG/L 2 2 U UG/L 2	Phenanthrene	<b>-</b> :		7/6n n	U cg/L	
N 1 U UG/L N 2 U UG/L 2 2 U UG/L 2 U UG/L 2 U UG/L	Anthracene	<b>&gt;</b> :		0 ug/L	1 mg/L	
	Fluoranthene	) <b>=</b>			7/55 A	

Sample No. : MW1-14 Lab Sample No. : 15928-19 Matrix : WATER Assoc Sample(s) : EB-12, TB-7, Test Result Flag Unit LLD	2 0 09/L 20 20 0 09/L 20 20 0 09/L 20 2 0 09/L 20 34 0 09/L 2 4 0 09/L 2 5 0 09/L 2 7 0 09/L 2 7 0 09/L 2 8 0 09/L 2 7 0 09/L 2 8 0 09/L 2 8 0 09/L 2 9 0	NI U UG/L 5 NI U UG/L 11 NI U UG/L 5 NI U MG/L 5 NI U MG/L 5 NI U MG/L 11 NI U MG/L 12 NI U MG/L 2 NI U MG/L 2 NI U MG/L 2 NI U MG/L 2
MU1-13 15928-18 15928-18 WATER EB-12, FB-2, FB-2	00000004444444444444444444444444444444	0 2 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
Sample No. : H Lab Sample No. : 11 Matrix : !! Assoc Sample(s) : E T Test Fesult Flag Unit	20 0 09/L 20 0 0	NY U UG/L NY U UG/L NY U WG/L NY U WG/L NY U MG/L
MU1-120 15928-43 WATER EB-12, FB-7, FB-2	XXXXXXXXXXXXXXX	0 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
nit	7/6n n 7/6n n	U UG/L U BG/L U BG/L U BG/L U BG/L U BG/L U BG/L U BG/L U BG/L U BG/L
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag L	N I I I I I I I I I I I I I I I I I I I	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-789-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene Bis(2-ethylbexyl)phthalate Di-n-octyl phthalate Benzo(b)flouranthene Benzo(x)flouranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(a,h)anthracene N Benzo(a,h)anthracene N Benzo(a,h)anthracene N Benzo(a,h)anthracene N	OTHER INORGANICS Dissolved Iron Dissolved Sodium Dissolved Gadium Dissolved Gadium Dissolved Magnesium Sulfate Chloride Nitrate Total Dissolved Solids Total Alkalinity Bicarbonate Alkalinity PH

Sample No. : Mul-14 Lab Sample No. : 15928-19RE Matrix : WAIER Assoc Sample(s) : EB-12, TB-7, TB-7, Test Result Flag Unit LLD	2
Sample No. : Mul-13 Lab Sample No. : 15928-18RE Matrix : WAIER Assoc Sample(s) : E8-12, IB-7, F8-2 Fest Result Flag Unit LLD	
Sample No. : MW1-12D Salab Sample No. : 15928-43RE La Matrix : UATER Ha Assoc Sample(s) : EB-12, As FB-2, FB-2 Result Flag Unit LLD	
oss Field 03-789-22 esting Labs	SEMI-VOLATILES (BY GC/MS)  Phenol Bis(2-chloroethyl)ether 2-thorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 2-Methylphenol Bis(2-chloroisopropyl)ether 4-Methylphenol Bis(2-chloroisopropyl)ether 4-Mitroso-di-n-propylamine Hexachloroethane Nitrobenzene Isophorone 2-Nitrophenol 2,4-Dimethylphenol Bis(2-chloroethoxy)methane 2-Nitrophenol 2,4-Dimethylphenol Bis(2-chloroethoxy)methane 1,2,4-Trichlorophenol 2,4-Dimethylphenol 2,4-Dichlorophenol 2-Methylnapthalene Hexachloroextopentadiene 4-Chloroaniline Hexachlorophenol 2-Methylnapthalene Bis(2-chlorophenol 2-Methylnapthalene 2-Mitrophenol 2,4-Dinitrotoluene 3-Nitroaniline Dimethyl phthalate Acenaphthylene 2,6-Dinitrotoluene 3-Nitroaniline Acenaphthylene 3-Nitroaniline C-Olinitrotoluene 3-Nitroaniline Acenaphthylene 3-Nitroaniline C-Olinitrotoluene Jethyl phthalate 4-Culorophenol Dibenzofuran 2,4-Dinitrotoluene Jethyl phthalate 4-Lulorophenol Dibenzofuran 3-Nitroaniline A-Nitrosodiphenylamine(1) 4-Nitrosodiphenylamine(1) 4-Bromophenyl phenylether Hexachlorophenol Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene

MM1-14 15928-19RE WATER WATER 18-7, FB-2. 20 20 20 20 20 4 4
Sample No. : #W Lab Sample No. : 15 Matrix : UA Assoc Sample(s) : EB Test
MM1-13 15928-18RE WATER WATER 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7,
Sample No. : Lab Sample No. : Matrix : Assoc Sample(s) : Test Result Flag Unit 2 U ug/L 4 U u
MM1-120 15928-43 RE WATER WATER 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7, 16-7
Sample No. : Lab Sample No. : Matrix Assoc Sample(s) : Lest
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs II Data April-May 1989  Eutylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene Bis(2-ethylhexyl)phthalate Bis(2-ethylhexyl)phthalate Di-n-octyl phthalate Benzo(b)flouranthene Benzo(b)flouranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(a,h,i)perylene

8enzo(g,h,1)perylene 4
(1) Cannot be separated from diphenylamine

M43-3 15928-23 UATER EB-14, TB-8, FB-2	0 0 0 0 0 0 0 0	0.5	
5	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	ng/L	1/5n 1/5n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6
NO. Le(S	כ ככ ככ	<b>-</b>	
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Fla	2 30 30 50 50 50 50 50 50 50 50 50 50 50 50 50	0.5	
ми3-20 15928-22 15928-22 16-13, 18-8, 18-2, it LLD	0.0000000000000000000000000000000000000	0.5	
Z	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	ug/L	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
No. Sample No. Sample(s)	22 222 2	, ,	
Sample No. Lab Sample No. Matrix Assoc Sample(s Test Result Fla	6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0	5*0	
MW3-2 15928-21 WATER WATER EB-13, FB-2 t LLD	0.0000000000000000000000000000000000000	0.5	
in	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ug/L	7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1
No. Le(s) Flag	כ כ כככ ככ	ت ت	
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag	2, 20 15 - 2 - 2, 2, 3, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,	0.5	
M43-1 15928-20 15928-20 159-13, 18-8, F8-2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.5	W-VWWWWWW
<u>.</u>	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	ug/L	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
r No. Ne(s) Ftag Un	22 2 22 2 2	<b>5</b>	
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag	0.2 8 37 8 8 8 8 8 8 8 8 8	0.5	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Dissolved Antimony Dissolved Thallium Dissolved Lead Dissolved Arsenic Dissolved Arsenic Dissolved Selenium Total Mercury Dissolved Silver Dissolved Selenium Dissolved Mickel Dissolved Mickel Dissolved Cadmium Dissolved Cadmium Dissolved Chromium	TPH OIL & GREASE	VOLATILE ORGANICS (BY GC/MS) Chloroethane Bromomethane Ghloroethane Methylene Chloride Chloroethane 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Buranone 1,1,1-Trichloroethane 2-Buranone 1,1,1-Trichloroethane 2-Buranone 1,1,2-Dichloropropane 2-Strichloroethane 1,2-Dichloropropane 2-Strichloroethane 1,2-Dichloropropane 2-Strichloroethane 1,2-Dichloropropane 2-Strichloroethane 1,2-Dichloropropane 2-Strichloroethane 3,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Tertanone 2-Hexanone 1,1,2-Tertanone 2-Hexanone 1,1,2-Tertachloroethane 1,1,2-Tertachloroethane 1,1,2-Tertachloroethane 1,1,2-Tertachloroethane 1,1,2-Tertachloroethane 1,1,2-Tertachloroethane 1,1,2-Tertachloroethane 1,1,2-Tertachloroethane 1,1,2-Tertachloroethane 1,1,2,2-Tertachloroethane 1,1,2,2-Tertach
			- 75

Sample No. : Mu3-3 Lab Sample No. : 15928-23 Matrix : WAFE Assoc Sample(s) : EB-14, TB-8, FB-2 Test Result Flag Unit LLD	20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Sample No. : Mu3-2D Lab Sample No. : 15928-22 Matrix : WATER Assoc Sample(s) : E8-13, T8-8, F8-2 Test Result Flag Unit LLD	7 1 1 6 1 7 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7
Sample No. : Mu3-2 Lab Sample No. : 15928-21 Matrix : WAIER Assoc Sample(s) : EB-13, 18-8, FB-2 Test Result Flag Unit LLD	
Sample No. : Mu3-1 Lab Sample No. : 15928-20 Matrix : WATER Assoc Sample(s) : E8-13, T8-8, F8-2 Test Result Flag Unit LLD	0.000
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysıs by Laucks Testing Labs RI Data April-May 1989	Phenol Bis(2-chloroethyl)ether 2-chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene 2,4-Bethylphenol Bis(2-chloroisopropyl)ether 4-Methylphenol Nitrobenzene 1 sophorone 2 witrophenol 2,4-Dimethylphenol 2,4-Dimethylphenol 2,4-Dimethylphenol 2,4-Dimethylphenol 2,4-Dichorophenol 1,2,4-Trichlorobenzene Hexachlorobradiene 4-Chloroaniline Hexachlorobenzene Hexachlorophenol 2,4-Dichorophenol 2,4-Dichorophenol 2,4-Dichorophenol 2,4-Dichorophenol 2,4-Dichorophenol 2,4-Dinitroplenol 3-Nitrophenol 4-Nitrophenol 4-Nitrophenol 4-Nitrophenol 4-Nitrophenol 4-Nitrophenol 4-Nitrophenol 4-Nitrophenol 4-Nitrosodiphenyleher Fluorene 5,6-Dinitro-2-Methylphenol 4-Nitrosodiphenyleher Fluorene 4-Chlorophenyl phenylether Fluorene 4-Dinitro-2-Methylphenol 4-Nitrosodiphenyleher Percachlorophenol Phenanthene Arbracene Anthracene Anthracene Anthracene Anthracene Anthracene

Ñ	3	w *********	
MW3-3 15928-23 WATER EB-14, IB-8,	ı		
	Flag Unit	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	
e No plec		מ ככככככ כככככ	
e No ampli x Sam	fest Result	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
Sample No. Lab Sample No. Matrix Assoc Sample(s)	ī œ		
-22	ווס	00-0000044444 v	¥0000000
MW3-2D 15928-22 WATER EB-13, TB-8,			J
	flag Unit	7/5n 7/5n 7/5n 7/5n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ug/L ug/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L
. No.	Fla	ב ממממממ מממכם	
s No.	rest Result	70000044444444444444444444444444444444	***************************************
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Resu		
MU3-2 15928-21 WATER E8-13, T8-8, F8-2	110	พพ./พพพพพพพพพพพ พ	_ ¥ N N N N − 1 N N N − 1 N N N − 1
	nit.		, , , , , , , , , , , , , , , , , , ,
. (s)	Flag Unit	7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1	ug/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L m
o. ile Ni mple		2222 22222 2	
Sample No. Lab Sample No. Mat.ix Assoc Sample(s)	Test Result	ww/wwwwwwwwww ×	272222222
Sample Lab sar Mat. ix Assoc	تع⊸		
0			<b>7</b> 101010 <b>7 7</b> 101010 <b>7</b>
MW3-1 15928-20 WATER EB-13, TB-8, FB-2	77		-00000000 ¥
: 15928- : 15928- : WATER : E8-13, : F8-2	ų		<b>v</b>
	flag Unit	7/6n 7/6n 7/6n 7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1	ug/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Flag		2222222222
e No sampt x : Sam	Test Result	2002 2012 212 213 2002 2003 2003 2003 20	***********
Sample No. Lab Sample Matrix Assoc Samp	Res	y ( am	×
		i pher	
SAIC IRP Project - Joe ^c oss field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		Pyrene Butylbenzylphthalate 2	
oss 1 03-74 estir		e alate	
oe c ₁ 827-1 ks 1 ₁ 89		ate idine phtha phtha ate cne ene ene ene acene	um Julids Julids Julity
01- 01- Lauc 7 78		thal benz acen xyU) thali anthi anthi cd)pi nthri eryli	ganetium cium nesium ad Sc ed Sc ity ity
oject No. by I-Ma		inthrum intro inthrum intro intro interpretation into interpretation interpretation into interpretation interpretation into interpretation interpretation into interpretation interpretation into interpretation into interpretation interpret	Solve Solve Solve Solve Te Alke
P Pro Dject Lysis Apri		lbenz Dichz O(a)a Sene Sene Octy O(b)f O(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1, No(1	issolved Manganese Dissolved Sodium Dissolved Calcium Dissolved Hagnesium Sulfate Choride Altrate Total Dissolved Solids Cotal Suspended Solids Cotal Alkalinity Bicarbonate Alkalinity Arbonate Alkalinity
SAIC IRP Project - Joe SAIC Project No. 01-82; Lab Analysis by Laucks RI Data April-May 1989		Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene Bis(2-ethylhexyL)phthalate Di-n-octyl phthalate Benzo(b)flouranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(a,h,i)perylene (1) Cannot be separated fre OTHER INORGANICS Dissolved Iron	Dissolved Manganese Dissolved Sodium Dissolved Calcium Dissolved Hagnesium Sulfate Chloride Nitrate Total Dissolved Solids Total Alkalinity Bicarbonate Alkalinity Carbonate Alkalinity
SAI SAI Lab RI		0	

Sample No. : Mw3·3 Lab Sample No. : 15/2/3 25/E Matrix : wA1ER Assoc Sample(s) : EB-14, 1B-8, FB-2 Test Flag Unit LLD	
Sample No. : Mu3-2D Lab Sample No. : 15928-22RE Matrix Assoc Sample(s) : EB-13, 18-8, FB-2 Test Result Flag Unit LLD	
Sample No. : Mu3-2 Lab Sample No. : 15928-21RE Matrix : WAIER Assoc Sample(s) : EB-13, 18-8, FB-2 Test Result Flag Unit LLD	22. 1
Sample No. : Mu3-1 Lab Sample No. : 15928-20RE Matrix : WATER Assoc Sample(s) : E8-13, 18-8, F8-2 Iest Result Flag Unit LLD	20
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis oy Laucks Testing Labs RI Data April-May 1989	Phenol Bis(2-chlorobenzen 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene 2,4-Bethylohenol Bis(2-chlorospylamine Hexachloroethane NITrophenol - 2,4-Dimethylohenol Bis(2-chloroethoxy)methane 2,4-Dimethylohenol Bis(2-chloroethoxy)methane 2,4-Dimethylohenol Bis(2-chloroethoxy)methane 2,4-Dimethylohenol C-Hethylohenol C-Hethylohenol Bis(2-chlorophenol C-Hethylohenol C-Hethylohenol C-Hethylohenol C-Hethylohenol C-Hethylohenol C-Chloroaniline Hexachlorocyclopentadiene 2,4,5-Trichlorophenol C-Chlorompthalene C-Chlorompthalene C-Chlorompthalene C-Chlorompthalene C-Chlorompthalene C-Chlorophenol C-Chl

E NO. : 15928-23RE PLOS : 15928-33RE PLOS : EB-14, I EB-2, FB-2, FB-2, FB-2, I UG/L U UG/L S U UG/L UG/L S U UG/L S U UG/L UG/L S U UG/L S U UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L UG/L U
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag 27 U ug 27 U ug 27 U ug 3 U ug 5 U ug 5 U ug 5 U ug
I HW3-20 I 15928-22RE I HATER I HATER I E8-13, I E8-13, I B-2, I Ug/L
Sample No. Lab Sample No. Matrix Assoc Sample(s)  Test Result Flag 2 U ug 2 U ug 2 U ug 2 U ug 4 U ug 4 U ug 4 U ug
HW3-2 HW3-2 HW4TER E(S): 188-13, 18-8, 18-8, 18-8, 18-7, 19-0, 10 ug/L 10
Sample No. Lab Sample No. Matrix Assoc Sample(s) Test Result Flag 2 U u 2 U u 2 U u 4 U u 4 U u 4 U u 4 U u 4 U u 4 U u 4 U u 4 U u 4 U u 4 U u 4 U u
: 15928-20RE : 15928-20RE : UATER : EB-13, TB-2, it LLD 2 LL 20 LL 20 L
Sample No. Lab Sample No. Matrix Assoc Sample(s)  Test Result Flag Un 9/20 ug/20 ug/20 ug/20 ug/20 ug/20 ug/20 ug/20 ug/20 ug/20 ug/40 ug/
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989  Butylbenzylphthalate 3,31-0ichlorobenzidine Benzo(a)anthracene Chrysene Bis(2-ethylhexyl)phthalate Bis(2-ethylhexyl)phthalate Di-n-octyl phthalate Benzo(b)flouranthene Benzo(c)pyrene Indeno(1,2,3-cd)pyrene Indeno(1,2,3-cd)pyrene Benzo(a,h)anthracene Benzo(a,h)anthracene

(1) Cannot be separated from diphenylamine

Sample No. : MW3-5 Lab Sample No. : 15928-25 Matrix : WATER Assoc Sample(s) : EB-13 FB-2	Test Result Flag Unit LLD	<b>55</b>	0.2 0 ug/L 0.2 13 0 ug/L 1 1 0 ug/L 1 25 ug/L 2 7 ug/L 1 7 ug/L 1 7 ug/L 1	0.5 U ug/L 0.5	1 0 ug/L 1 0
Sample No. : Mu3-4 Lab Sample No. : 15928-24 Matrix : WATER Assoc Sample(s) : EB-14 FB-2	Test Result Flag Unit LLD		7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	0.5 U ug/L 0.5	1 U ug/L
SAIC IRP Project - Joc Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		INORGANICS Dissolved Antimony Dissolved Thallium Dissolved Lead Dissolved Arsenic Dissolved Arsenic	Total Mercury Dissolved Silver Dissolved Copper Dissolved Beryllium Dissolved Nickel Dissolved Cadmium Dissolved Chromium Dissolved Zinc	TPH OIL & GREASE	VOLATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane Ninyl Chloride Chlorocethane Methylene Chloride Acetone 1, 1-Dichlorocethane 1, 2-Dichlorocethane 1, 2-Dichlorocethane 1, 1, 1-Trichlorocethane 2-Butanone 1, 1, 1-Trichlorocethane 2-Butanone 1, 1, 1-Trichlorocethane 2-Butanone 1, 2-Dichlorocethane 2-Butanone 1, 2-Dichloropane 1, 2-Dichloropane 1, 2-Dichloropane 2

Sample No. : MV3-5 Lab Sample No. : 15928-25 Marrix : UATER Assoc Sample(s) : EB-13 IB-8	Test Result Flag Unit LLD		1/6n N	1/6n n	1/6n n	1/bn n	1/6n n	n ng/L	1/6n n	ng/r	n ng/L	U ug/L	1 ng/r	U ug/L	T/Sn n	. ug/L	7/60 0	n ug/L	η ng/L	U ug/L	7/60	n 09/L	U ug/L	U ug/L	7/60 0 08/1	η/gn η	n ng/L	7/80 0	n ug/L	u ug/t	0 09/L U 09/L	U ug/L	U ug/L	7/6n n	1/6n (1	U ug/L	U ug/L	7 mg/r	1 no/L	n ug/L	2 U ug/L 2	7/5n n	1/6n n	
Sample No. : Mu3-4 Lab Sample No. : 15928-24 Matrix : UATER Assoc Sample(s) : EB-14 FB-2	Test Result Flag Unit LLD		כ	<b>ɔ</b> :	2 0 ug/L 2	<b>&gt;</b> =	) =	ב	⊃:	<b>&gt;</b> =	ng/L	1/6n n	0 ug/L	U ug/L	<b>-</b> :	0 ug/L	1 ug/L	0 ug/L	U ug/L	n ug/L	7/6n n	U U9/L	U ug/L	U ug/L	1 mg/L	n ug/L	U ug/L	0 ng/L	0 ug/L	U ug/L	0 ug/L	n ug/L	1/6n n	7/5n n	0 ug/L	n ug/L	U ug/L	1/6n n	1 ng/L	ug/L		U ug/L	0 ug/L	ı Î
SAIC IRP Project · Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		SEMI-VOLATILES (BY GC/MS)	Phenol	Bis(2-chloroethyl)ether	2-Chlorophenol	1,3-Ulchlorobenzene 1 4-Dichlorobenzene	Benzyl alcohol	1,2-Dichlorobenzene	2-Methylphenol	Bis(2-cnloroisopropy(Jetner 2-Methylohenol	N-Nitroso-di-n-propylamine	Hexachloroethane	Nitrobenzene	2-Nitroplenot	2,4-Dimethylphenol	Benzoic Acid	81S(Z-chloroethoxy)methane	1,2,4-Trichlorobenzene	Napthalene	4-Chloroaniline	Rexachlorobutadiene	4-Cnloro-3-methylphenol 2-Mathylpapthalene	Hexachlorocyclopentadiene	2,4,6-Trichlorophenol	2,4,5-Trichlorophenol	2-Nitroaniline	Dimethyl phthalate	Acenaphthylene	3-Nitroaniline	Acenaphthene	2,4-Dini ophenol	Dibenzofuran	2,4-Dinitrotoluene	Diethyl phthalate	4-Chlorophenyl phenyletner Fliorene	4-Nitroaniline	4,6-Dinitro-2-Methylphenol	N-Nitrosodiphenylamine(1)	4-Bromophenyl phenylether	Pentachlorophenol	Phenanthrene	Anthracene	Di-n-butylphthalate	ן ניסו סורווכוזיכ

Sample No. : Hu3-5 Lab Sample No. : 15928-25 Matrix : WATER Assoc Sample(s) : EB-13 FB-2	Test Result Flag Unit LLD	2 0 09/L 20 2 2 2 0 09/L 20 2 0 09/L 20 2 2 0 09/L 20	units
Sample No. : Mu3-4 Lab Sample No. : 15928-24 Marrix : WATER Assoc Sample(s) : EB-14 FB-2	flag Unit	20 09/L 20 20 20 20 20 20 20 20 20 20 20 20 20	
SAIC IRP Project - Joe Foss Field Sample No. SAIC Project No. 01-827-03-769-22 Lab Sample Lab Analysis by Laucks Testing Labs Matrix RI Data Apri:-flay 1909 Assoc Samp	Test	ene ylbenzylphthalate ylbenzylphthalate y-Dichlorobenzidine zo(a)anthracene ysene n-octyl phthalate n-octyl phthalate noctyl	盂

SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-789-22	Sample : . Lab Sample No.	Š.	: MW3-4 : 15928-24RE	Sample No. Lab Sample No.	NO.		3-5 928-25RE	
Lab Analysis by Labos Rl Data April-May 1989	Assoc Sample(s)	le(s)	: EB-14 18-8 58-2	Assoc Sample(s)	ote(s)	• ••	MAICK E8-13 18-8 F8-2	
	Test Result f	flag Unit	it LLD	Test Result	Flag	Flag Unit	93	
SEMI-VOLATILES (BY GC/MS)	c			·	=	5	r	
Bis(2-chloroethyl)ether	. ~	7/60 0 08/F				1/6n na/r	ı ~ı	
2-Chlorophenol	2			8		ng/L	2	
1,3-Dichlorobenzene	~			~		ng/L	~	
1,4-Dichlorobenzene	~ ~	7/6n n		~ ~	) : ====================================	ug/L	~ ~	
benzyl alconol	<b>4</b> 0	7/65.		20		7/60	<b>u</b> 0	
2-Methylpheno!	4 6			10	_	ug/L	10	
Bis(2-chloroisopropyl)ether	10		ات:	10	_	1/6n	· ~	
4-Methylphenol	7			~		1/6 13/1	~	
N-Nitroso-di-n-propylamine	~ ~	0 vg/L		~	) 	1/6n	~ ~	
Nitrobenzene	7 7			~	) ) )	9/L	۰ ۲	
Isophorone	8			8		1/6 13/1	8	
2-Nitrophenol	<b>4</b> (			4 (	э: Э:	1/61 1	<b>4</b> (	
Z,4.Dimetnytphenot	7 L	66		7.5	) = =	1/6 10/1	٦ ٢	
Bis(2-chloroethoxy)methane	10	U 49/L		, ~	, ,	ng/L	2	
2,4-Dichorophenol	7			4		1/S	4	
1,2,4-Trichlorobenzene	~ ~	7/6n n		~ ~	э: Э:	ng/L	~	
Napthalene	<b>4</b> 0	6 5 5		<b>\$</b> 0	) = ) =	1/6/1 110/1	<b>3</b> (	
4-Chiorodaliume Hexachiorodaladae	۷,۷			3 6	, ,	9/r 9/L	10	
4-Chloro-3-methylphenol	14	1/6n n		14	; <u>=</u>	ng/L	4	
2-Methylnapthalene	8	) Gn n		~	э Э	9/1	۰ ۲	
Hexachlorocyclopentadiene	4	9 9		4	) 	7/5n	4 .	
2,4,6-Trichlorophenol	4 ~	)    -		3 4	o =	7/6	<b>3</b> 4	
2,4,2-11 icitor optieno. 2-Chloronaothalene	7 (4			. 67	, ,	7/5n	· ~	
2-Nitroaniling	7			4	э Э	9/1	4	
Dimethyl phthalate	(N (			~ ~	э: Э:	9/L	N 10	
Acenaphtnylens 2.6-Dinitrotoluene	<b>7</b>			u 4	) )	1/5n na/t	u ~3	
3-Nitroaniline	11			=	_ສ	ng/L	=	
Aceraphthene	~ ;			~;	э: Э:	9/1	۰,	
2,4-Dinitrophenol	5.5			7.7	)   	3/c	7.7	
Dibenzofuran	- ~	)       		۲,	, ,	1/6n	7	
2,4-Dinitrotoluene	4			41		ng/L	40	
Diethyl phthalate	~ ~			N 6	) 	ug/L	<b>7</b> (	
4-Chlorophenyl phenylether	v 20	7/5n 0 n8/r		<b>,</b> 0	) ) )	1/6n na/r	<b>v</b> ~	
4-Nitroaniline	14			7		ng/L	7	
4,6-Dinitro-2-Methylphenol	21			23		ug/L	۲,	
N-Nitrosodiphenylamine(1)	7.			7	) 	ug/L	۰ 7	
4-Bromophenyl phenylether	4 4	65 : 0 :		<b>t</b> √	ə =	7/60	<b>3</b> 4	
nexacntorobene Pentachlorophenol	7.7			21	, ,	9/L	77	
Phenanthrene	~	U ug/L	٠,٠	Ν.	<b>D</b> :	ug/L	~ ∩	
Anthracene	2 6			v	) ====================================	ug/L	<b>u</b>	
DI-n-butylphthalate Fluoranthene	<b>4</b> 2	0 ug/r		10	2 ⊃ 2 ú	1/6n 100/r	۰ ۲	
Pyrene	~	1/6n n		8	<b>5</b>	ng/L	2	

SAIC IRP Project - Joe Foss Field	Sample No.	: MW3-4	Sample No. : MW3-5	
SAIC Project No. 01-827-03-769-22	Lab Sample No.	: 15928-24RE	Lab Sample No. : 15928-25RE	
Lab Analysis by Laucks Testing Labs	Matrix	: WATER		
RI Data April-May 1989	Assoc Sample(s)	: £8-14		
•	•	18-8		
		FB-2	FB-2	
	Test		Test	
	Result Flag Unit	Init LLD	Result Flag Unit LLD	
Butylbenzylphthalate	2 0	3/r 5	2 U ug/L 2	
3,3'-Dichlorobenzidine	21 U U	3/1 21	21 U ug/L 21	
Benzo(a)anthracene	2 2 0	3/F 2	2 U ug/L 2	
Chrysene	2 0	3/1 5	2 U ug/L 2	
Bis(2-ethylhexyl)phthalate	14 B U	3/1 2	17 B ug/L 2	
Di-n-octyl phthalate	2 0	3/1	2 U ug/L 2	
Benzo(b)flourenthene	ž 2	3/F 4	7 7/6n N 5	
Benzo(k)flouranthene	2. →	7/6	7 7/6n n 7	
Benzo(a)pyrene	ñ 5 7	3/r 7/E	7 n ng/L 4	
Indeno(1,2,3-cd)pyrene	ā ⊃ •	3/1	7 7/6n n 7	
Oibenzo(a,h)anthracene	7/6n n 7	3/r 4	7 7/6n n 7	
Benzo(g,h,i)perylene	ñ 2 7	3/r 4	7 n ng/r 7	

(1) Cannot be separated from diphenylamine

18-4 15928-13 WATER	ררס	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
** ** ** **	flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	1/6n 18/7 18/1
e No	Flag			222
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	***************************************		
18-3 15928-9 Water	110	o พพะพพที่ท _ะ		
	Flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	1/6n 1/6n
. No.	(Lag			
No.		***************************************		
Sample No. Lab Sample No. Marrix Assoc Sample(s)	Test Result			
18-2 15928-4 <b>UA</b> TER	770	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result			
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. 6	Flag Unit	7/6n 1/6n 1/6n 1/6n 1/6n	7/50 7/50 7/50 7/50 7/50 7/50 7/50 7/50	9 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
e Ko ple(	Flag	22222222222	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	בככי
e No ample X Sam		**************		
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result			
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		Antimony Thallium Lead Arsenic Selenium cury Silver Copper Beryllium Nickel Cadmium Zinc	ATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane Bromomethane Bromomethane Chiloroethane Carbon Disulfide 1,1-Dichloroethane 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Butanone 1,1-Dichloroethane 1,2-Dichloroethane 2-Butanone 1,1-Dichloroethane 2-Butanone 1,1-Dichloroethane 2-Butanone 1,1-Dichloroethane 2-Butanone 1,1-Dichloroethane 2-Butanone 1,1-Dichloroethane 1,2-Dichloropropene 1,2-Dichloropropene 1,2-Dichloroethane 1,2-Dichloroethane Dibromochloromethane 1,2-Dichloroethane 1,2-Dichloroethane 1,3-Dichloroethane 1,1,2,2-Ietrachloroethane 1,1,2,2-Ietrachloroethane 1,1,2,2-Ietrachloroethane 1,1,2,2-Ietrachloroethane	• •
SAIC IRP Project SAIC Project No. Lab Analysis by RI Data April-M		Dissolved Antimony Dissolved Thallium Dissolved Thallium Dissolved Arsenic Dissolved Selenium Total Mercury Dissolved Silver Dissolved Copper Dissolved Copper Dissolved Copper Dissolved Copper Dissolved Copmium Dissolved Codmium Dissolved Codmium Dissolved Codmium Dissolved Codmium	iph OIL & GREASE  VOLATILE ORGANICS (BY GC/MS) Chloromethane Vinyl Chloride Chloroethane Vinyl Chloride Chloroethane 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Butanone 1,1,1-Trichloroethane 2-Butanone 1,1,1-Trichloroethane 1,2-Dichloroethane 2-Butanone 1,1,2-Dichloroethane 1,1,1-Trichloroethane 1,2-Dichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane Sarbon Tetrachloropropene Frichloroethene Dibromochloromethane 1,1,2-Trichloroethane Trichloroethene Dibromochloromethane 1,1,2-Trichloroethane Senzene Trans-1,3-dichloropropene Benzene Trichloroethene	Ethylbenzene Styrene Total Xylenes
			E-85	

16-4 15928-13 Water	710	00000000000000000000000000000000000000
	Flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	
18-3 15928-9 Water	777	
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s No. Sample No. Sample(s)		
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18-1 15928-2 Water	ררם	. พ.
	Unit	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-05-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		Phenol Bis(2-chloroethy!) ether 2-chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 2-Methylphenol Bis(2-chloroisopropy!) ether 4-Methylphenol Bis(2-chloroethane N. Ni troso-di-n-propy! amine Hexach loroethane N. Itrobenzene 1.5-Phonochane N. Itrobenzene 2.4-Dimethy! chrool Benzoic Acid Bis(2-chloroethane) 2.4-Dimethy! chrool Benzoic Acid Bis(2-chloroethane) 2.4-Dimethy! chrool Benzoic Acid Bis(2-chloroethane) 2.4-Dimethy! chrool 2.4-Dimethylphenol 2.4-Dimethylphenol 2.4-Firichloropentadiene 2.4-Dimethylphenol 2.4-Firichlorophenol 2.4-Firichlorophenol 2.4-Firichlorophenol 2.4-Dimitrotoluene 3-Ni troaniline Acenaphthene 2.4-Dimitrotoluene 3-Ni troaniline Acenaphthene 2.4-Dimitrotoluene Diethy! phthalate 4.4-Dimitrosoliphenylether Fluorene 2.4-Dimitrosoliphenylether Fluorene 4.6-Dimitro-2-Methylphenol N. Ni trosodiphenylether Hexachlorophenol Phenanthene Anthracene Pentachlorophenol Phenanthene Anthracene Di-n-butylphthalate

18-4 15928-13 Water	110	2002	7004	1444		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
	Flag Unit	1/6n 1/6n 1/6n 1	7,7 7,6 7,6 7,6 7,6 7,7	1 09/L 1 09/L 1 09/L		W W3/K W3/K W3/K W3/K W3/K W3/K W3/K W3/
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result Fl	Z Z Z Z	ZZZZZ			**********
18-3 15928-9 Water	017	00000	N W W 4	14444		0 8 8 8 8 8 8 8
Sample No. : Lab Sample No. : Matrix : Assoc Sample(s) :	t Flag Unit	NI 0 09/L NI 0 09/L NI 0 09/L NI 0 09/L		NT U U9/L		NI U UG/L NI U UG/L NI U MG/L NI U MG/L
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18-2 15928-4 Water	רוס	~~ <u>8</u> ~~	V V I I I I	4444		0 8 8 8 8 8 8 8 8
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result			######################################		************
18-1 15928-2 Water	93	22000	10044	4444		0 8-888-19-19-18-18-18-18-18-18-18-18-18-18-18-18-18-
No. : e(s) :	flag Unit		0 09/L 0 09/L 0 09/L			AAA A Bee u A Bee u
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result Fl			Z Z Z Z	enylamine	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene	Bis(2-ethylhexyl)phthalate Di-n-octyl phthalate Benzo(b)flouranthene Benzo(k)flouranthene	Benzo(a)pyrene Indeno(1,2,5-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	(1) Cannot be separated from diphenylamine	OTHER INORGANICS Dissolved Iron Dissolved Manganese Dissolved Manganese Dissolved Galcium Dissolved Alganesium Sulfate Chloride Nitrate Total Dissolved Solids Total Alkalinity Bicarbonate Alkalinity Ph

18-8 15928-44 Water	רנס	0 ~~~~~~~~~	0.5	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Sample No. : 18 Lab Sample No. : 155 Hatrix : WA! Assoc Sample(s) :	Test Result Flag Unit		NT U ug/L	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
No. : 18-7 nple No. : 15928-30 : WATER Sample(s) :	lest Result flag Unit LLD	NI U UG/L 5 NI U UG/L 5 NI U UG/L 1 NI U UG/L 5 NI U UG/L 6 NI U UG/L 1	NT U vg/L 0.5	1 0 0 0 0 / 1 1 1 1 1 0 0 0 0 / 1 1 1 1
: TB-6 Sample : 15928-17 Lab Sam : WATER MATTIX	717	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9.5	, 
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result Flag Unit	NT U UG/L	NT U ug/L	1 0 09/L
Sample No. : TB-5 Lab Sample No. : 15928-16 Matrix : WAIER Assoc Sample(s) :	st ult Flag Unit LLO	NT U ug/L 5 NT U ug/L 5 NT U ug/L 5 NT U ug/L 5 NT U ug/L 6 NT U ug/L 0.2 NT U ug/L 1 NT U ug/L 1 NT U ug/L 1 NT U ug/L 1	NT U ug/L 0.5	
SAIC IRP Project - Joe Foss Field Sample SAIC Project No. 01-827-03-769-22 Lab San Lab Analysis by Laucks Testing Labs Marrix RI Data April-May 1989 Assoc S	Test Result	INORGANICS  Dissolved Antimony Dissolved Thallium Dissolved Lead Dissolved Selenium Total Mercury Dissolved Silver Dissolved Copper Dissolved Copper Dissolved Gerylium Dissolved Capper Dissolved Capper Dissolved Capper Dissolved Cafmium Dissolved Chromium Dissolved Chromium	TPH OIL & GREASE	Chloromethane Endomethane Bromomethane Vinyl Chloride Chloroethane Winyl Chloride Chloroethane Nethylene Chloride Actone 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Butanone 1,1,1-Trichloroethane 2-Butanone 1,1,1-Trichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,1,2-Trichloroethane Dibromochloromethane 1,1,2-Trichloroethane Benzene 1,1,2-Trichloroethane Bromoform 4-Methyl-2-Pentanone 2-Mexanone 1oluene 1,1,2,2-Tetrachloroethane

Sample No. : 18-8 Lab Sample No. : 15928-44 Matrix : WATER Assoc Sample(s) :	Test Result Flag Unit LLD		<b>,</b>
Sample No. : 18-7 Lab Sample No. : 15928-30 Matrix : WATER Assoc Sample(s) :	Test Result Flag Unit LLD		1
Sample No. : 18-6 Lab Sample No. : 15928-17 Matrix : WATER Assoc Sample(s) :	Test Result Flag Unit LLD		0 03/E
Sample No. : 18-5 Lab Sample No. : 15928-16 Matrix : WATER Assoc Sample(s) :	Test Result flag Unit LLD	THE RESTREE OF STATE	1/6n
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		Phenol Bis(2-chloroethyl)ether 2-chlorophenol 1,3-Dichlorobenzene Benzyl a.cohol 1,2-Dichlorobenzene Benzyl a.cohol 1,2-Dichlorobenzene Benzyl a.cohol 1,2-Dichlorobenzene 2-Kethylphenol Ris(2-chloroisopropyl)ether 4-Methylphenol Ris(2-chlorophenol 1,2-d-Dimethylphenol 2,4-Dimethylphenol Bis(2-chlorophenol 2,4-Dimethylphenol 2,4-Dichlorophenol 1,2,4-Trichlorophenol 1,2,4-Dichlorophenol 2,4-Dichlorophenol 2,4-Dinitrotoluene Dipenzofuran ine Acanarhthene 2,4-Dinitrotoluene 2,4-Dinitrotoluene 3-Nitroaniline 4-Nitroaniline 4-Chlorophenyl phenylether Fluorene 2,4-Dinitrotoluene 3,4-Dinitrotoluene 3,4-Dinitrotoluene 3,4-Dinitrotoluene 3,4-Dinitrotoluene 3,4-Dinitrotoluene 3,4-Dinitrotoluene 3,4-Dinitrotoluene 3,4-Dinitrotoluene 3,4-Dinitrophenol 4-Nitroaniline 4,6-Dinitrotoluene 5,4-Dinitrophenol 5,4-Dinitrophenol 6,6-Dinitrophenol 7,4-Bromophenyl phenylether Fluorene 4-Nitroaniline 4,6-Dinitrophenol 8,6-Dinitrophenol 9,6-Dinitrophenol 9,6-Dinitrophenol 9,6-Dinitrophenol 1,7-Bromophenol 1,7-Bro	Fluoranthene

: T8-8 : 15928-44 : WATER	, , , , , , , , , , , , , , , , , , ,	
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e No. ple(s	Flag Unit U ug/L U mg/L	
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T8-6 15928-17 Water	00000000444444	
	Unit Unit Unit Unit Unit Unit Unit Unit	
e No.	Flag Unit U 19/1	
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result Transmin	
18-5 15928-16 WATER	00000000444444 00000000000000000000000	
	Unit ug/L ug/L ng/L ng/L ng/L ng/L ng/L ng/L ng/L n	
e No. ole(s	Flag Unit U 49/L	
Sample No. Lab Sample No. Matrix Assoc Sample(s)		
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-Nay 1989	Pyrene  Butylbenzylphthalate 3,3'-Dichlorobenzidine aenzo(a)anthracene Bis(2-ethylhexyl)phthalate Bis(2-ethylhexyl)phthalate Bin-octyl phthalate Benzo(b)flouranthene Benzo(c)flouranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene (1) Cannot be separated from diphenylamine OIHER INORGANICS Dissolved Iron Dissolved Galcium Dissolved Galcium Dissolved Galcium Dissolved Manganese Nitrate Suspended Solids Fotal Suspended Solids Fotal Alkalinity Bicarbonate Alkalinity Bicarbonate Alkalinity Bill Carbonate Alkalinity	į
	E-90	

FB-2 15928-29 WATER	917	ហហ	- 0	0.2		- 2 -		0.5	-		- w	<b>-</b> u	<b>-</b>				- w			<b>,-</b> ,	- w	~- N	- r	-1	~) <del>(</del> -	m	m r	- m	4- h	) <del></del> -	<del></del>
Sample No. : F Lab Sample No. : 1 Matrix : L Assoc Sample(s) :	Test Result Flag Unit	2 N ng/L 5 U ng/L	<b>-</b>		<b>)</b> ) :		1 U ug/L 5 ug/L	0.5 U ug/L	1 U ug/L	<b>-</b> :		2 B ug/L			1 0 ug/t		3 U ug/L		1 U ug/L	<b>-</b> :	3 U ug/L	⊃:	1 ua/L		3 U ug/L	· ⊃	<b>&gt;</b> :	_	1 U ug/L	<b>&gt;</b>	1 0 ug/L 1 U ug/L
Sample No. : FB-1 Lab Sample No. : 15928-10 Matrix : WATER Assoc Sample(s) :	Test Result Flag Unit LLD	1/6n n 1/6n n	7/6n 0 0	<b>၁</b> ၁ :	1/6n na/r	2 U ug/L 2 1 ug/L 2	7/6n 7/6n 0	0.5 U ug/L 0.5	1 U ug/L 1		3 U u9/L 3		1 U ug/L 5		1 6 69/1 1		3 U ug/L 3		1 U ug/L 1	ug/L	1 0 ug/L 1	ug/L	U9/L	1/6n n	ug/L	7/60 N	ug/L	3 n ng/t 3	ug/L	ug/t ug/t	1 U ug/t 1 1 U ug/L 1
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-789-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		INORGANICS Dissolved Antimony Dissolved Thallium	Dissolved Lead Dissolved Arsenic	Dissolved Selenium Total Mercury	Dissolved Silver	Dissolved Beryllium Dissolved Mickel	Dissolved Chronium Dissolved Chronium Dissolved Zinc	TPH OIL & GREASE	VOLATILE ORGANICS (BY GC/MS) Chloromethans	Bromomethane	Vinyl Chloride Chloroethane	Methylene Chloride	Acetone Carbon Disu(fide	1,1-Dichloroethene	1,1-Dichlorostnone	Chloroform	1,2-Dichloroethane 2-Butanone	1,1,1-Trichloroethane	Carbon Tetrachloride Vinyl Acetate	Bromodichloromethane	1,2-Dichloropropane cis-1.3-Dichloropropene	Trichloroethene	Ulbromochloromethane 1 1 2-Trichloroethane	Benzene	Trans-1,3-dichloropropene	4-Methyl-2-Pentanone	2-Hexanone	ietrachloroethene 1,1,2,2-Tetrachloroethane	Toluene	Cnloropenzene Ethylbenzene	Styrene Iotal Xylenes
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FB-2 15928-29 Water	ררס	;	žŻ	Z	¥	Z	ž	: 'z	Z	7	Z 2	<b>.</b>	H	7	ž	<b>Z</b>	7	N	<b>2</b> :	Z Z	Z	Z	2	Z:	Z	ž	¥	<b>Z</b> 5	Z 'Z	H.	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Z	×	Z	Z.	ž 2	Ē	¥	Z :	7	Z 2	<b>X</b>	N.	Z
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e No. ple(s	Flag	:	<b>&gt;</b> =	) =	2	⇒:	> =	> =	<b>-</b>	<b>=</b> :	<b>&gt;</b> =	-	) >	_	<b>&gt;</b> :			<b>-</b>	<b>=</b> :	<b>-</b> :	<b>=</b>	) <b>–</b>			<b>-</b> :	_			<b>&gt;</b> =	,		<b>&gt;</b> =				<b>&gt;</b> =	<b>&gt;</b> =	<b>5</b>	<b>&gt;</b> :	<b>ɔ</b> :	<b>&gt;</b> =	<b>5</b>	)	>
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FB-1 15928-10 WATER	ση	ć	N	1 0	ν.	N (	<i>~</i> c	<i>1</i> 0	2	2	~	۸ ۱	1 2	7	~ 5	3 ^	14	8	7	<b>~</b> r	<b>V V</b>	· ~	7	4	4 (	V 4	· ~1	2 ·	10.	~	50	20	<b>u v</b>	2	~	N v	20 t	ام	7	7 %	გ °	v (1	12	~
	lnî t	:	7/61	7/50 1/60	ng/L	ug/L	ug/L	160/L	J/6n	ng/L	ug/L	7,61	7/6n ng/L	ug/t	ug/L	1/6n	1/6n	ug/L	ng/L	ug/L	1/6n	1/67	7/5	ug/L	7/6n	1/6n	1/gn	19/L	767	ug/r	ng/L	7 gg /	1/6n	1/6n	1/6n	u9/L	769	-7/6r	ng/L	7/6n	1/6n	765	1,65 1,7	ug/L
Ko. (e(s)	flag Unit		- -				د د					) =				) ===					) > =			ر ت	<b>)</b>	- - -	, ,	<b>-</b> :	- - -	, ,	ر ت	ت د	) =	, ,			) ====================================					- -	, ,	<b>5</b>
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result F	(	N 0	10	10	~	<b>ν</b> τ	<b>,</b> ,	1 70	2	~ ~	<b>1</b> 0	1 ~	7	~ 2	2 0	7 4	. 23	7	~ .	V <	÷ (\	1 4	4	4 (	V 4	- 22	ω.	4 E	_N	50	ຊິ	V V	۰ ۲۷	2	N ·	, 52	20	7	4	202	<i>,</i> ,	10	2
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by taucks Testing Labs RI Data April-May 1989		SEMI-VOLATILES (BY GC/MS)	Phenol Pic/2-chlococthy/lother	2-Chlorophenol	1,3-Dichlorobenzene	1,4-Dichlorobanzene	Benzyl alcohol	1,2-Dichlorobenzene	Bis(2-chloroisopropy()ether	4-Methylphenol	N-Nitroso-di-n-propylamine	Hexachtoroethane	Isophorone	2-Nitrophenol	2,4-Dimethylphenol	Benzolc Acid	BIS(Z-Chlorochood)	1.2.4-Trichlorobenzene	Napthalene	4-Chloroaniline	Hexachlorobutadiene	4-cn(oro-3-methylphenot	Rexachlorocyclopentadiene	2,4,6-Trichlorophenol	2,4,5-Trichlorophenol	2-Chloronapthalene	Dimethylphthalate	Acenaphthylene	2,6-Dinitrotoluene	Acenaphthene	2,4-Dinitrophenol	4-Nitrophenol	Ulbenzoturan 2 4-Dipitrotoluapa	Diethyl phthalate	4-Chlorophenyl phenylether	Flourene	4-Hitroaniline 4 A.Dioitro-2-Methylphopol	N-Nitrosodiphenylamine(1)	4-Bromophenyl phenylether	Hexachlorobenzene	Pentachlorophenol	Phenanthrene	Oi-n-butylohthalate	Flouranthene

FB-2 15928-29 Water	110		×	¥	H	7	= :	<b>z</b> :	Ē 5	<b>=</b>	Z	H	F	Z	<b>Z</b> :	Ē	; ;	=	2	Ħ	¥	Z :		<b>=</b> =	=	Ħ	=	¥ 2	Z Z	Ħ	×	= =	ē 5	i	¥	¥	<b>=</b> !	<b>X</b> :	<u> </u>	ĔZ	: <del> </del>	Z	¥	Ħ	Z :	Z	Z	:
	Flag Unit		ng/L	ng/L	ng/L	ng/L	7/5n	ug/L	1/6n	7/65	1/6n	ng/L	ng/L	ng/L	ng/L	76n	7,60	7/60 1/60	1/6n	1/6n	ng/L	ng/L	7/gs	7,5	7/80	7/6n	ng/L	7/6n	7/60	1/6n	ng/L	7/6n	1/6n	1/6/1	1/50	ng/L	ng/L	ug/L	1,6/L	1/60	1,60 1,00 1,00 1,00 1,00 1,00 1,00 1,00	7/50 1/60	1/bn	ng/L	ug/L	7/60	1/6/1 1/6/1	ì
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result		, N	IN IN	N.	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	2	<b>=</b> :	2 3	Z X	Z	IN	IN	X	<b>7</b>	2 2	2 2	Z	H	K	¥	12	Z	E 3	ž	Z	Z :	* 1	Z	Ħ	Z	2 :	Ēà	=	7	Z	7	¥ ;	z 5	2 13	. X	Z	Z	N	K	Z :	Z	
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	Flag Unit		7/60	ug/L	ng/L	ng/L	1/6n	765	7,67	7/65	1/bn	ug/L	ng/L	ng/L	ng/L	5	3	7/65	7/87	7/6n	7/6n	1/6n	ng/L	1/60	7/8	ug/L	ng/L	7/60	3,5	1/gn	ng/L	7/g 1	7/6n	3 -	7/8	J/gn	J/gn	1/6/	7/6n	1/65 1/65	1/60	7/5n	1,60 1,40	ng/L	ug/L	1/6n	ug/L	i D
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result		~	~	2	~	~ (	7	40	۱ ۷	· ~	7	4	~	~	1 (	v (	ર્^	1 47	2	4	~	N	<b>3</b> C	<b>1</b> 4	4	4	~	<b>≯</b> ~	101	4	5,	7 6	3 5	3 ~	7	~	~ ~	<b>v</b> v	3 £	} ^	14	• •	20	~	<b>v</b> (	<b>,</b> ,	,
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		SEMI-VOLATILES (BY 62/MS)	Phenol	Bis(2-chloroethyl)ether	2-Chlorophenol	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Benzyl alcohol	2.Wethylchene	Bis(2-chloro)sopropyl)ether	4-Methylohenol	N-Nitroso-di-n-propylamine	Hexachloroethane	Nitrobenzene	Sophorone	2 / Dimothylphonol	פיטייטיט אַטיִּל	Bis/2-chlocoethoxy)methane	2.4-Dichorochenol	1,2,4-Trichlorobenzene	Napthalene	4-Chloroaniline	Hexachlorobutadiene	3-Math:/acathologo	Z-nethytnaphilaterie Rexachlorocyclopentadiene	2,4,6-Trichlorophenol	2,4,5-Trichtorophenot	2-Chloronapthalene	Dimethylphalate	Acenaphthylene	2,6-Dinitrotoluene	3-Nitroaniline	Acenaphthene	Z,4-U IIII LI OPIEROL	Dibenzofuran	2,4-Dinitrotoluene	Diethyl phthalate	4-Chlorophenyl phenylether	Fluorene	4-Nitroaniline	w.p.trocodichecolamine(1)	4-Bromodenyl obenylether	Hexach locobenzene	Pentachlorophenol	Phenanthrene	Anthracene	D1-n-rutylphthalate	ב נחסו מונוופוופ

Sample No. : f8-2 Lab Sample No. : 15928-29 Matrix : WATER Assoc Sample(s) :	Test Result Flag Unit LLD		N 1 0 09/L NI	NT U UG/L 5 NT U UG/L 1 NT U UG/L 5 NT U UG/L 5 NT U MG/L 1 NT U MG/L 2 NT U MG/L 2 NT U MG/L 2 NT U MG/L 2
FB-1 15928-10 Water	077	0000000	1444444	\$ - 50 50 1 10 10 10 10 10 10 10 10 10 10 10 10
Sample No. : Lab Sample No. : Matrix :: Assoc Sample(s) :	Test Result flag Unit		7/6n n + 7/6	NI U U U U U U U U U U U U U U U U U U U
SAIC 1RP Project - Joe Foss Field S SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs M RI Data April-May 1989		Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene Bis(2-ethylbexyl)phthalate	Benzo(b) flouranthene Benzo(a) flouranthene Benzo(a) pyrene Indeno(1,2,3-(4)pyrene Olbenzo(a,h) anthracene Benzo(g,h, 1)per ylune (1) Cannot be separated from dishenylamine	OTHER INORGANICS Dissolved from or prient Dissolved From Dissolved Magnesium Dissolved Galcium Dissolved Magnesium Sulfate Chloride Nitrate Total Dissolved Solids Total Alkalinity Bicarbonate Alkalinity Carbonate Alkalinity

fb-2 15928-29RE Water	710		~ ~	۰,	2	~ (	<b>4</b> 0	۰ ۵	~	~ ~	<b>U -1</b>	~	~ .	<b>4</b> (	, Ç	,~	14	7	4	<b>V</b> (	<b>v</b> 4	۲,	4	4	<b>4</b> 0	<b>V V</b>	- 72	~	4 5	<u>.</u>	21	21	α,	4 (	<b>u</b> 0	۰ ۵	7	21	۷.	4.	, <u>,</u>		۰2	8	~ ~	<b>.</b>
	Flag Unit		76n	, נ נ	1/6n	7/6n	7/6n	7/60 7/60	ng/L	1/6n	7/61	7/6n	ng/L	ng/L	7/6n	1/60	1/5n	ng/L	ng/L	7,53	7/67	, 8 , 7	ng/L	ng/L	7,8	7 2	7/6n n8/r	1/6n	ng/L	7,5	1/60	ng/L	ng/L	7/6 :	7,60	ug/L	ng/L	ng/L	ng/L	7/6n	1/6/L	1/67	1/6n	ng/L	ug/L	ng/L
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	•	~ ~	<b>1</b> ~	10	00	<b>7</b> 0		8	ν.	V 4	. ~	~	4 (	2.5	, ~	1 ~ 3	7	4	7	<b>V</b> ~	<b>1</b> 7 1	4	4	40	<b>V</b> V	7	~	4.5	<u> </u>	21	21	~	4.0	7 6	4 6	· <b>7</b>	21	8	4 -	7 7	; ^	: ~	~	~ (	4
F8-1 15928-10RE Water	777		z	Ž	1N	<b>!</b>	Z	ź	X	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Z 2	Z	H	<b>Z</b> :	ž	<u> </u>	ž	, r	¥	<b>Z</b> 5	<b>z</b> 5	- <u>1-</u>	7	H		2 2	Z	K	<b>=</b> :	Ē '3	Z	IN	Z	<u>-</u> !	<b>z</b> :	žŻ	X	K	M	<b>Z</b> :	<u> </u>	E 7	Z	×	Z :	Ē
	nit		1/6n	1/6/1	<u>.</u> _	ng/L	۲۶	17	2	ng/L	ל ∻	. ~	1/6n	1/gn	7,60	ζ =	! ~	ng/L	ng/L	₹;	ל =	1 ~		7	7/F	₹.	. ~	7	₹;	₹ 5	. ~	2	7	₹;	₹ :	760	! ~	۲,	ng/L	ug/L	1/6n	7/60	, <u>-</u>	ng/L	u9/t	1/6n
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result		<b>X</b> 5	2 2	Z	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			7	Z :	ž	= =	Z	2	Z		×	Z	H	2	ž		H	Z		2 2		H	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	<b>=</b> 1	2	I.R	N	<b>'</b>	Z ?	Z 2	Ź	X	X	2	2 5	2 2	ž ž	N.	Z :	Z
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		SEMI-VULATILES (BY GC/MS)	Phenol processil session	2-Chlorophenol	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Benzyl alcohol	2-Methylphenol	Bis(2-chloroisopropyl)ether	4-Methylphenol	N-Nitroso-di-n-propylamine Hexachloroethane	Nitrobenzene	Isophorone	2-Nitrophenol	'essering ford	81s(2-chlocoethoxy)methane	2.4-Dichorophenol	1,2,4-Trichlorobenzene	Naythalene	4-Chloroaniline	Hexachlorobutadiene	2-Methylpapthalene	Hexachlorocyclopentadiene	2,4,6-Trichlorophenol	2,4,5-Trichlorophenol	2-chloronaptnalene 2-vitabooilia	Dimethylphthalate	Acenaphthylene	2,6-Dinitrotoluene	5-Nitroaniline	2.4-Dinitrophenol	4-Nitrophenol	Dibenzofuran	2,4-Dinitrotoluene	Diethyl phthalate	4-unlorophenyi phenylether	4-Nitroaniline	4.6-Dinitro-2-Methylphenol	N-Nitrosodiphenylamine(1)	4-6, smophenyl phenylether	Hexachlorobenzene	Pentachlorophenol	Anthracene	Di-n-butylphthalate	Fluoranthene	Pyrene

FB-2 15928-29RE Water	ררס	<b>0</b> 0000044444
Sample No. Lab Sample No.: Matrix Assoc Sample(s):	Test Result Flag Unit	21 0 09/L 21 0 09/L 22 0 09/L 23 0 09/L 24 0 09/L 25 0 09/L 26 0 0 7 27/50 0
FB-1 15928-10RE Water	977	
Sample No.: Lab Sample No.: Matrix :	Test Result Flag Unit	1/5n 0 1N 1N 10 60/1 1N 1N 10 60/1 1N 1N 60/1
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene Bis(2-ethylhexyl)phthalate Di-n-octyl phthalate Benzo(b)flouranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene

(1) Cannot be separated from diphenylamine

Sample No. : EB-5 Lab Sample No. : 15928-6 Matrix : WATER Assoc Sample(s) :	Test Result Flag Unit LLD	5 U ug/L 5 U ug/L 5 U ug/L 6.2 U ug/L 1.9 Ug/L 1 U ug/L	0.5 U ug/L 0.5	1 U ug/L
: EB-4 : 15928-5 : WATER	flag Unit LLD	U ug/L 5 U ug/L 5 U ug/L 6 U ug/L 6 U ug/L 0.2 U ug/L 1	U ug/L 0.5	U ug/L U
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result F	, 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	9.0	พ _ช
E8-3 15928-3 WATER	ררס	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.5	
No. :	Flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	U ug/L	7/5n n n 1/5n n n 1/5
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result Fla	71-211111111111111111111111111111111111	0.5	, 
E8-1 15928-1 Water	717	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.5	
	Flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ng/L	7/66 7/66 7/66 7/66 7/66 7/66 7/66 7/66
e No. ample No. sample(s)	Flag	C	<b>¬</b>	מככם מהההפתכת הההההה בככם החום
Sample Lab Se Matriy Assoc	Test Result		0.5	- r - M 4 W M M M M - M
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		INORGANICS Dissolved Antimony Dissolved Thallium Dissolved Lead Dissolved Arsenic Dissolved Selenium Total Mercury Dissolved Selenium Total Mercury Dissolved Copper Dissolved Gogner Dissolved Geryllium Dissolved Antekel Dissolved Cadmium Dissolved Chromium Dissolved Zinc	TPH OIL & GREASE	VOLATILE ORGANICS (8Y GC/MS) Chloromethane Bromomethane Vinyl Chloride Chloroethane Methylene Chloride Acetone Carbon Disulfide 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Butanone 2-Butanone 1,1-Trichloroethane 2-Butanone 1,2-Dichloroethane 2-Butanone 1,2-Dichloroethane 2-Butanone 1,1-Trichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Hexanone 1,1,2-Trichloroethane Benzene 1,1,2-Trichloroethane 1,1,2-Trichloroethane 2-Hexanone 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 2-Hexanone 1,1,2-Trichloroethane 1,1,2-Trichloroethane 2-Hexanone 1,1,2-Trichloroethane 2-Hexanone 2-Hexanone 2-Hexanone 2-Hexanone 3-Horoethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 2-Hexanone 2-Hexanone 2-Hexanone 3-Hexanone 3-Hexanone 3-Hexanone 3-Hexanone 5-Hexanone 6-Hybleroene 6-Hyblero

Sample No. : EB-5 Lab Sample No. : 15928-6 Matrix : WATER Assoc Sample(s) :	ult flag Unit LLD	
	Test D Result	
: EB-4 5. : 15928-5 : WATER (S) :	Flag Unit LLD	
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result F	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
EB-3 15928-3 WATER	ררס	กดดดดดดดดดดดดด _{ดด} ดานรถทางกราชานายกราชานายการ
	flag Unit	
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	
EB-1 15928-1 WATER	רוס	ดดดดดดดดดดดดดดดดดดดดดดดดดดดดดดดดดดดดด
	Flag Unit	7/6n n n 1/6n n n n n n n n 1/6n n n n n n n n n n n n n n n n n n n
Sample No. Lab Sample No. : Matrix Assoc Sample(s)	Test Result	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		Phenol Bis(2-chloroethyl)ether 2-chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene 2-Kethylphenol Bis(2-chlorostane) 1,2-Dichlorobenzene 2-Kethylphenol Bis(2-chlorostane) 1-2-Dichlorostane 1-2-Hethylphenol Nitrobenzene 1-2-Hirophenol 1-2,4-Dimethylphenol Bis(2-chlorothoxy)methane 2,4-Dimethylphenol 1,2,4-Trichlorobenzene Napthalene 1,2,4-Dimethylphenol 2,4-Dimethylphenol 2,4-Dimethylphenol 2,4-Dintroaniline Hexachlorocyclopentadiene 2-Hethylphanol 2,4-Dintroaniline Hexachlorocyclopentadiene 2,4-Dintroaniline Dimethylphthalate 2,4-Dintroaniline Acenaphthene 3,4-Dintroaniline Acenaphthene 3,4

: EB-5 : 15928-6 : UATER :	it . LLD		٠.	، ب	, r	``			1	٠,	· -			_		۔ بے			ہے	پ		۔۔		۔	ہے ا	 0.2		·-	۰۰	· -			,
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	r	4 (	7 6	₹'	~	~	_	~	1 4	• ‹	* `	•	7	7	4			*	2	2	2	2	z	2	z	T.	2	2	: 2	: =	Z	
EB-4 15928-5 VATER	ררס	r	<b>J</b> (	7 8	ə,	2	~	~	~	1 4	• <	•	4.	4	7	7			'n	-	S	S	ĸ	-	-	0.2	-	-	. 2	۰,	; (	7	
	Jnit	7	,	767	76	٦ ا	7/gr	1/br	7	1/01	,	7	7 j	J/gr	7/fr	ug/L			J/Er	1/6	7/50	7/6	1/0	7/0	7/00	1/00 1/00	ma/L	7/00	7/0		,	3/1	
No.	Flag Unit	=	<b>.</b>	<b>-</b>	<b>-</b>	<b>-</b>		85		=	· =		- -	<b>-</b>	כ	ני			ر ت	ر ت	_ =	- ב	2	=	=		-	, D	=	· =	) :	= =	
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result																																
EB-5 15928-3 Water	911	c	3 (	7 5	₹'	7	~	~	~	7		,	4	4	4	7			Ŋ	-	'n	'n	ď		-	0.2	·		٠.	۰ د	ى د	7	
	ij	5	٠,	ַל;	₹;	7	7	7	=	. =	\ <b>-</b>	٠,	٦,	7	ィ	ng/L			7	7	7	٦,	. =	! =	! <b>~</b>	! =	′ ≺	. <	! =	! =	ί:	7	
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No. plc:		,	, ,	~ ·	- ·	~	~	7	~	1 13				<b>-</b>	<u>-</u> '	 7			H	NT.	I				12		· -			: :		_ =	
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result			•	<b>V</b>																												
E8-1 15928-1 Water	977	c	J (	٠,	2,	2	~	~	~	1 7	• <		•	7	4	4			Ŋ	-	ίv	'n	·	-	-	0.2			٠,	10	1 (	٧	
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result		3 (	,	2,	7	. 4	-	•	1 7	• ~	•	*	7	7	4	henylamine		z		2	Z	. 2	. 2	. 2	. 2	. 3	. 2	. <b>a</b>	. 2	£ 1	~	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		OCCO		Butylbenzylphthalate	5,5'-Dichloropenziaine	Benzo(a)anthracene	Chrysene	Bis(2-ethylhexyl)phthalate	Di-n-octvl phthalate	Renzo(b) flouranthene	Depart (A) (1 pile 10 pt	מבוול אלון נחתו קוורוובווב	genzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)parylene	(1) Cannot be separated from diphenylamine	OTHER INDRGANICS	Dissolved Iron	Dissolved Manganese	Dissolved Sodium	Dissolved Calcium	Dissolved Magnesium	Sulfare	Chloride	Nitrate	Total Dissolved Solids	Total Suspended Solids	Total Alkalinity	Ricarbonate Albalinity	Dical Datace Athering	Carbonate Alkalinity	

EB-9 15928-12 WATER	777	o ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	0.5	
	Flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	J/6n O	1/6n n 1/6n n 1/6n n 1/6n n 1/6n n 1/6n n n n 1/6n n n n 1/6n n n n 1/6n n n n n n n n n n n n n n n n n n n
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result Fl	¥# <u>`</u>	0.5	
EB-8 15928-11 Water	777	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.5	
	flag Unit	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	1/6n	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
s No. Sample No. Sample(s)	Flag	7717	ב	2222 222222222222222222222
Sample No. Lab Sample No. Matrix Assoc Sample(s	Test Result	F	0.5	พพ ^พ พัพพ-พพ-พพ-พ-พ
EB-7 15928-8 WATER	רנס	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.5	
	Unit	7/6a 1/6a 1/6a 1/6a 1/6a 1/6a 1/6a 1/6a 1	ug/L	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
e No.	Flag Unit	ວລ	Þ	
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	######################################	0.5	
EB-6 15928-7 WATER	ררס	0 88-884-68-6-	0.5	
	Unit	7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1	ng/L	7/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1
e No poleci	flag Uni	n 2	ລ	2222 222222222222222222222222
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	7	0.5	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		INORGANICS  Dissolved Antimony Dissolved Thallium Dissolved Lead Dissolved Arsenic Dissolved Selenium Total Mercury Dissolved Silver Dissolved Silver Dissolved Reryllium Dissolved Combium Dissolved Camium Dissolved Chromium Dissolved Chromium	TPH OIL & GREASE	VOLATILE CRGABICS (BY GC/MS) Chloromethane Bromomethane Vinyl Chloride Chloroethane Chloroethane Chloroethane 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Butanone 1,2-Dichloroethane 2-Butanone 1,1-Irichloroethane 2-Butanone 1,2-Dichloroethane 2-Butanone 1,2-Dichloroethane 2-Butanone 1,2-Dichloroethane Carbon Tetrachloride Vinyl Acetate Bromodichloromethane 1,2-Dichloropene 1,2-Dichloropene Cis-1,3-Dichloropene Trichloroethane 1,1-2-Trichloroethane 1,1-2-Trichloroethane 2-Hexarone Trans-1,3-dichloropene Benzen Trans-1,3-dichloroethane 1,1,2-2-Tetrachloroethane Tetrachloroethane Tetrachloroethane Styrene Chlorobenzene Ethylbenzene Styrene Styrene
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18-9 15928-12 Water	011	ุกการและเลือน และ เลือน และ เล
Sumple No. : E Lab Sample No. : 1 Matrix : Massoc Sample(s) :	Test Result Flag Unit	
EB-8 15928-11 Water	רום	
Sample No. : £8: Lab Sample No. : 15: Matrix : WA: Assoc Sample(s) :	Test Result Flay Unit	
Sample No. : EB-7 Lab Sample No. : 15928-8 Matrix : WATER Assoc Sample(s) :	Test Result Flag Unit LLD	
Sample No. : E8-6 Lab Sample No. : 15928-7 : Matrix : WATER Assoc Sample(s) :	Test Result Flag Unit LLD	7
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-Hay 1989		Phenol.  Phenol.  1. Subject of coethyl) ether  2. Chlorophenol  1. Subject of coenzere  1. Subject of coenzere  1. Subject of coenzere  2. Herkylphenol  Benzyl alcohol  1. Support of coenzere  2. Herkylphenol  8 is (2-chlorospropyl) ether  4. Herkylphenol  8 is (2-chlorospropyl) ether  8 is ophorophenol  2. Support of coenzere  2. Horophenol  2. Support of coenzere  8 is (2-chlorosphenol  2. Support of coenzere  9 in it roopin in e  8 in troopin in e  8 in troopin in e  9 in it roopin in e  9 in it roopin in e  10 in it roopin in e  11 in it ood of ee  12 in it cool uene  13 in it cool uene  14 in it coopin in too in

Sample No. : E8-9 Lab Sample No. : 15928-12 Matrix : WATER Assoc Sample(s) : Test Pecult Flag Hoit 110	7/6n n 1/6n n n n 1/6n n n n n n n n n n n n n n n n n n n	NT U UG/L 5 NT U UG/L 1 NT U UG/L 5 NT U MG/L 5 NT U MG/L 1 NT U MG/L 0.2
Sample No. : 68-8 Lab Sample No. : 15928-11 Hatrix : WATER Assoc Sample(s) : Test Recult Flag Hair IID	7/6n n 1/6n n 1/6n n 1/6n n 1/6n n 1/6n n 1/6n n 1/6n n 1/6n n	. NT U UG/L S NT U UG/L S NT U UG/L S NT U UG/L S NT U MG/L S NT U MG/L S NT U MG/L S NT U MG/L 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Sample No. : EB-7 Lab Sample No. : 15928-8 Matrix Assoc Sample(s) : Test Result Flag Unit 110	7/6n n 1/6n n 1/6n n 1/6n n n n n 1/6n n n n n n n n n n n n n n n n n n n	NT U ug/L S NT U ug/L 1 NT U mg/L 5 NT U mg/L 5 NT U mg/L 1 NT U mg/L 0.2
Sample No. : E8-6 Lab Sample No. : 15928-7 Matrix : WATER Assoc Sample(s) : Test Result Flag Unit 110	7/6n n 1/6n n n 1/6n n n 1/6n n n	And the second s
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Pyrene Burylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene Bis(2-ethylhexyl)phthalate Di-n-octyl phthalate Benzo(b)flouranthene Benzo(k)flouranthene Benzo(x)flouranthene Benzo(x)flouranthene Benzo(x)hinnthalate Benzo(x)hinnthalate Benzo(x)hinnthalate	(1) Carnot be separated from diphenylamine Dissolved Iron Dissolved Hanganese Dissolved Magnesium Dissolved Sodium Dissolved Magnesium Sulfate Chloride Intare Total Dissolved Solids Intare Total Dissolved Solids Intare Total Alkalinity Carbonate Alkalinity MH

EB-13 15928-27 WATER	611	0 NN-NNÚ-L-N-L	0.5	
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EB-11 15928-15 WATER	9	•	0	:
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lo. (s)	Flag Unit		1/Bn /	
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EB-10 15928-14 Water	91	0 0 0 0	0.5	
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. 8	Flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ng/L	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
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Foss -03- Test				SC/HS Toper e ethar
Joe 1-827 ucks 1989		ica ica ica ica		(BY
ct. 0.0 W La		Antimony Thallium Llead Arsenic Selenium cury Syliver Copper Beryllium Hickel Codmium	SE	IIICS  Me we
Proje ect N sis b oril-		2222222222222	GREA	ORGAI ORGAI Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo Chlo
IRP Projenaly: Ita A		Dissolved Antimony Dissolved Thallium Dissolved Thallium Dissolved Lead Dissolved Arsenic Dissolved Selenium Total Mercury Dissolved Silver Dissolved Silver Dissolved Beryllium Dissolved Camium Dissolved Camium Dissolved Camium Dissolved Chromium	)IL &	Chloromethane Bromomethane Bromomethane Ninyl Chloride Chloroethane Hethylene Chloride Carbon Disulfide 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Butanone 1,1,1-Trichloroethane 2-Butanon 1,1,1-Trichloroethane 2-Butanone 1,1,2-Dichloropropane 1,2-Dichloropropane 1,2-Dichloropropane 1,2-Dichloropropane 1,2-Dichloropropane 1,2-Dichloropropane 1,2-Dichloropropane 1,2-Dichloropropane 1,2-Dichloropropane 2-Hexanone 1,1,2-Trichloroethane Benzene Dibromochloromethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Tetrachloroethane
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-Hay 1989		INDRGANICS Dissolv Dissolv Dissolv Dissolv Total H Dissolv Dissolv Dissolv Dissolv Dissolv Dissolv Dissolv Dissolv Dissolv Dissolv Dissolv	TPH OIL & GREASE	O

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E8-13 15928-27 Water		•
	Flag Unit	1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n
ė No. ple(s		
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	######################################
EB-12 15928-26 WATER	ררס	
	flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
e No.		
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	
EB-11 15928-15 WATER	ררם	00000000000000000000000000000000000000
	flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
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Sample Nc. Lab Sample No. Matrix Assoc Sample(s)	Test Result	บทบทบทบทบทบานกรก <u>C</u> ทรทรทหารกรรรมรายราย 2025
EB-10 15928-14 WATER	ררס	๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛๛
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SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data Apri'-May 1989		SEMI-VOLATILES (EY GC/MS) Phenol Bis(2-chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 2-Methylchenol Bis(2-chloroisopropyl)ether 4-Methylchenol Bis(2-chloroethane Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene 1 sophorone 2,4-Dimethylchenol Benzoic Acid Bis(2-chloroethane 1,2,4-Trichlorobenzene Napthalene 4-Chloroaniline Hexachlorochtadiene 4-Chloroaniline 1,2,4-Trichlorophenol 2,4-Dichorophenol 2,4-Dichorophenol 2,4-Frichlorophenol 2,4-Frichloroph

EB-13 15928-27 Water	613	O VERNITATION VERVICES	000¥
** ** ** **	Flag Unit	7/60	NA 1/20 1/20 1/20 1/20 1/20 1/20 1/20 1/20
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result F	######################################	
EB-12 15928-26 WATER	777	THENERAL NAME OF STREET STREET	22 2 X
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Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result		
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EB-10 15928-14 Water	071		unn
	hit	1/6m 1/6m 1/6m 1/6m 1/6m 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n 1/6n	MA NA
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e Ko. ample Samp		NWANANANA o SASSASANANANANA	ZZZZZ
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result	heny l.ami	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		Pyrene  ButylLenzylphthalate 3,3-Dichlorobenzidine 8nzo(a)anthracene 8is(2-ethylhexyl)phthalate 8is(2-ethylhexyl)phthalate 8nzo(b)flouranthene 8enzo(b)flouranthene 8enzo(b)flouranthene 8enzo(c)flouranthene 8enzo(c)flour	Total Suspended Solids Total Alkalinity Bicarbonate Alkalinity Carbonate Alkalinity pH

Sumple No. : £6·13 Lab Sample No. : 15928·27½ Matrix : WalfR Assoc Sample(s) :	Test Result flag Unit LLD	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Sample No. : EB-12 Lab Sample No. : 15928-26RE Matrix : WATER Assoc Sample(s) :	Test Result Flag Unit LLD	
Sample No. : [B-11 Lab Sample No. : 15928-15RE Matrix : WATER Assoc Sample(s) :	Test Result Flag Unit LLD	N
Sumple No. : EB-10 Lab Sample No. : 15928-14RE Matrix : WAIER Assoc Sample(s) :	Test Result Flag Unit LLD	NI U U9/L  NI U
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data Aril-Hay 1989		SEMI-VOLATILES (BY GC/MS) Phenol Bis(2-chlorobenzene 1,4-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene 1 sophorone 2-Hitrobenzene 1 sophorone 2-Hitrophenol 2,4-Dimethylphenol 1,2,4-Trichlorobenzene 1 sophorone 2-Hitrophenol 2,4-Dimethylphenol 2,4-Dimethylphenol 2-Kethylnapthalene 4-Chloro-3-methylphenol 2-Kethylnapthalene 4-Chloro-3-methylphenol 2-Kethylnapthalene 2-Ghoromapthalene 2-G

Sumple No. : EB-13 Lab Sample No. : 15928-27kt Matrix : WAIER Assoc Sample(s) :	Test Result Flag Unit LLD 2 U ug/L 2 4 U ug/L 2 4 U ug/L 4 5 U ug/L 5 6 U ug/L 6 6 U ug/L 6 7 U ug/L 7
Sample No. : EB-12 Lab Sample No. : 15928-26RE Matrix : WATER Assoc Sample(s) :	Test Result Flag Unit LLD 2 U ug/L 4 U ug/L 6 U ug/L 6 U ug/L 7 U ug/L
Sample No. : EB-11 Lab Sample No. : 15928-15RE Matrix : WATER Assoc Sample(s) :	Test  Result Flag Unit LLD  NI U ug/L
Sample No. : EB-10 Lab Sample No. : 15928-14RE Matrix : WATER Assoc Sample(s) :	Test  Result Flag Unit LLD  NI U ug/L
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	Test Result Butylbenzylphthalate 3.3'-Dichlorobenzidine Bisco(a)anthracene Bis(2-ethylhexyl)phthalate Di-n-octyl phthalate Renzo(b)flouranthene Benzo(x)flouranthene Benzo(x)flouranthene Benzo(a)phyrene Dibenzo(a,h)anthracene Benzo(a,h,i)perylene NI Cannot be separated from diphenylamine

EB-14 15928-10 WATER	077	o ถณะถดด่ะยะดะยะ	0.5	
	Flag Unit	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n	ng/L	7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n 7/6n
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Sample No. Lab Sample Matrix Assoc Sampl	Test Result F	. 0 ~ 0 ~ ~ 0	0.5	
SAIC IRP Project'oe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		INORGANICS  Dissolved Antimony Dissolved that Lium Dissolved Lead Dissolved Selenium Total Mercury Dissolved Silver Dissolved Silver Dissolved Morket Dissolved Morket Dissolved Morket Dissolved Gadmium Dissolved Cadmium Dissolved Cadmium Dissolved Zinc	TPH OIL & GREASE	VOLATILE ORGANICS (BY GC/MS) Chloromethane Bromomethane Chloroethane Methylene Chloride Chloroethane 1,1-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 2-Butanone 2-Butanone 1,2-Dichloroethane 2-Butanone 1,2-Dichloroethane 2-Butanone 1,1-Trichloroethane 2-Butanone 1,2-Dichloroethane 2-Butanone 1,2-Dichloroethane 1,2-Dichloropropane 1,2-Dichloropropane 1,2-Dichloropropane 1,2-Dichloromethane 1,2-Dichloropropane 2-1,2-Dichloroethane Bromoform 1,1-2-Trichloroethane Benzene 1,1-2-Trichloroethane Benzene 1,1,2-Trichloroethane Bromoform 4-Methyl-2-Pentanone 2-Hexanone Tetrachloroethane 1,1,2-Trichloroethane Bromoform 5-Hexanone 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane Bromoform 5-Hexanone 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 2-Hexanone 1,1,2-Trichloroethane 1,1,2-Trichloroethane 2-Hexanone 1,1,2-Trichloroethane 2-Hexanone 1,1,2-Trichloroethane 2-Hexanone 1,1,2-Trichloroethane 1,1,2-Trichloroethane 2-Hexanone 1,1,2-Trichloroethane 2-Hexanone 1,1,2-Trichloroethane 1,1,3-Trichloroethane

: EB-14 : 15928-10 : WATER 吕 Test Result Flag Unit 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 h 7 / 5 Sample No. Lab Sample No. Matrix Assoc Sample(s) SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989 Benous Action
Bis(2-chlorophenol
1,2,4-Trichlorophenol
1,2,4-Trichlorobenzene
Hapthale
4-Chloroa ine
Hexachlorobutadiene
4-Chloro-3-methylphenol
2-Methylnapthalene
Benousophenol
2,4,6-Trichlorophenol
2,4,5-Trichlorophenol
2,4,5-Trichlorophenol
2,4,5-Trichlorophenol
2,4,5-Trichlorophenol
2,4,5-Trichlorophenol
3,4,5-Trichlorophenol
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3,4,5-Trichlorophenol
3,4,5-Trichlorophenol
3,4-Dinitrophenol 4-Nitronaline 4,o-Dinitro-2-Methylphenol N-Nitrosodiphenylamine(1) 4-Bromophenyl phenylether Hexachlorobenzene Bis(2-chloroisopropyl)ether 4-Methylphenol N-Nitroso-di-n-propylamine Hexachloroethane Nitrobenzene 2,4-Dinitrotoluene Diethyl phthalate 4-Chlorophenyl phenylether Bis(2-chloroethyl)ether SEMI-VOLATILES (BY GC/MS) 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl alcohol 1,2-Dichlorobenzene 2-Methylphenol Isophorone 2-Nitrophenol 2,4-Dimethylphenol Benzoic Acid Anthracene Di-n-butylphthalate Fluoranthene Pentachlorophenol -Nitrophenol Dibenzofuran Phenanthrene Fluorene Phenol

E8-14 15928-10 WATER	רום	SENERGE SENERG
 . G	Unit	YN 1/66 1/66 1/66 1/66 1/66 1/66 1/66 1/6
. No.	flag	כככככככככככ ככככככככככ
Sample No. Lab Sample No. Matrix Assoc Sample(s)	Test Result F	Sny tamine Miliamine Milia
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-789-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989		Butylbenzylphthalate 3,3-Dichlorobenzidine Benzo(a)anthrac.ne Bis(2-ethylhexyl)phthalate Bis(2-ethylhexyl)phthalate Benzo(b)flouranthene Benzo(b)flouranthene Benzo(c)pyrene Indeno(1,2,2-d)pyrene Indeno(1,2,2-d)pyrene Indeno(1,2,2-d)pyrene OTHER INDREANICS Dissolved Iron Dissolved Iron Dissolved Iron Dissolved Galcium Dissolved Anganese Dissolved Maganese NN Dissolved Maganesium NN Sulfate Chloride Nitrate Nitrate Chloride Nitrate Distolved Solids NN Total Alkalinity Bicarbonate Alkalinity PH

: EB-14 No. : 15928-10RE : WATER :e(s) :	ig Unit LLD	ng/L		1/6 1/8	ng/L	ng/L	7/67	.g/L	ng/L	7/60	7/50 1/50	ng/L	767	1/6n	ug/L	ug/L	7/80	ng/r		1/6/1 0/6/1	ng/L	7/8n	7/60	ng/L	U ug/L 2	7/60	ng/L			ug/L	7 7/6n n	1/6n	ug/L	U U9/L 4	1/60 1/60	ng/L	7/5n n	2 7/60	-3/5n		u ug/t 2	3
Sample No. Lab Sample No Matrix Assoc Sample(	Test Result Flag	n .	2 :		_		יי יי			0 =	· ~		40			<b>7</b> ^		_	⊃: ~`	3 N	-				~ ~						4 ~				. ~						, c	
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data April-May 1989	CENT. UNI ATTI EC YRY CELMEN	Phenol	Bis(2-chloroethyl)ether	1.3-Dichlorobenzene	1,4-Dichlorobenzene	Benzyl alcohol	1,2-Dichlorobenzene 2-Mathylphanol	Bis(2-chloroisopropyl)ether	4-Nethylphenol	N-Nitroso-di-n-propylamine	Nitrobenzene	Isophorone	Z-Nitropherol	Benzoic Acid	Bis(2-chlorcethoxy)methane	2,4-Dichorochenol	Vactbalene	4-Chloroaniline	Hexachlorobutadiene	4-Chloro-3-methylphenol 2-Methylpaothalene	Hexachlorocyclopentadiena	2,4,6-Trichlorophenol	2,4,3-irichloromenoi 2-Chloromanthalene	2-Nitroaniline	Dimethylphthalate	Acenaphtnytene 2 6-Dinitogoluene	3-Nitroaniline	Acenaphthene	4-Nitrochenol	Dibenzofuran	2,4-Dinitrotoluene	4-Chlorophenyl phenylether		4-Nitroaniline	N-Witrosodichenylamine(1)	4-Bromophenyl phenylether	Hexachlorobenzene	Pentachlorophenol	Anthracene	Di-n-butylphthalate	Fluoranthene Pyrene	

	ררם	8	21	2	2	~	2	4	7	4	7	4	7
	Unit		7/6n	7/Gn	ug/L	7/gn	ng/L	7/gs	7/Sn	ug/L	ng/r	<u>~</u>	ng/L
	Flag	>	⊃	⊃	5	뿍	>	>	2	_	=	>	>
Test	Result Flag	7	21	2	7	•	2	4	4	4	7	4	7
		Butylbenzylphthalate	3,3'-Dichlorobenzidine	Benzo(a)anthracene	Chrysene	Bis(2-ethylhexyl)phthalate	Di-n-octyl phthalate	Benzo(b)flouranthene	Benzo(k)flouranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene

(1) Cannot be separated from diphenylamine

	Test	flag Hoite	Level of Detection	Test Results	Flag Units	Lowest Level of Defection		Flag Units	Level of Detection
PETROLEUM HYDROCARBONS	Kesui ts 0.5	riag unic U mg/L	0.5	0.5	U mg/L	0.5	0.5	U mg/L	0.5
	í			ı					t
	n I	1/6m n	<u>ا</u>	٠ <u>۲</u>	1/60 C	, I	^ <del> </del>	7 6 6 7 6 6 7 6 6 6 6 6 6 6 6 6 6 6 6 6	n
Lead(by Graphite Furnace)	<b>-</b>		-				-		-
	, K		<b>1</b>	<b>5</b> !		1	<b>5</b> !		TN:
	<b>Z</b> :	7/6E D	<b>=</b> :	= =		- Z	- L	U mg/t	
	Z :		ž =	ž	1,61	Z 5	E 3		: ±
	£ 2		E 7	, <u>, , , , , , , , , , , , , , , , , , </u>		<b>.</b> 5	2		¥
Intel Suspended Solids	: h		2 2	: <del>'</del>		<u> </u>	5		<b>=</b>
Total Dissolved Solids		U mq/L	2	7		7	7		Z Z
	<b>-</b>			N.		IN.	T.X	U mg/L	H
	N.		H	H		K	H		<u> </u>
	H		TX.	F		N.	¥.		F .
Total Alkalinity	Ħ			H		H	×		=
Bicarbonate Alkakinity	K			Z .		7	- :		<b>=</b> !
inity	Z 5	Umg/L			U mg/L Units	ž 'ž	2 'Z	U mg/L Units	Z 'Z
	:	) :							
VOLATILE ORGANICS	•		•				•		-
		1/8n n			7/6n n			0 ug/L	
	- •								
	- ^		- 14	- 1-		- 14	- W		- M
with the children	o •-	1,67	<b>-</b>	·	0 09/1	,	·	1/6n n	
8	- ~		ري -	. 20		· w	'n		S
Carbon Disutfide		1/60 N				-	-		-
1,1-Dichloroethene	-		_			<del>,</del> .			<b>.</b> - ,
1,1-Dichloroethane	<b></b> -		<b></b> ,	<b>,</b> .		- •	<b>.</b> .	7/En n	- •
oroethene	<b>,-</b> - •			+	0 ug/L	·• •			
cis-1,2-Dichloroethene	<b>-</b> -	7 mg/L			7 60 1			7/80	
oroethene	- +								
	- 14	7/60 1	- 141	· M	1/60 A	·M	'n		m
900	-، ۱			,		-			<b>,-</b>
1,1,1-Trichloroethan	. —		-	_		-	-	1/6n n	_
Carbon Tetrachloride				-		-	<b></b>		_
	-		~	<b>.</b>	U ug/L	<b>.</b> .	- ,	7/65 C	-,
Bromodichloromethane	<del>,     </del> ,		<b>-</b> ,	<b>-</b> ,			- •		
1,2-Dichloropropane	<b>,</b> ,		- •	-,					
Fichioroethene	- •				7,67			1/8/1	. ,-
benzene Oibassach Jassaches	- 1	7 ng/r	- ~	- W		۰ ۲	۰ ۱۰		· M
1 1 2-trichlonothan	o •-		۰,	) <b>-</b> -		,		1/60 0	-
2			. ,	-		_	-		_
4-Methyl-2-Pentanone	m		m	м		m	m	U vg/L	m I
	M		m	m		<b>M</b> I	M I		<b>0</b> 1
1,1,2,2-Tetrachloroethane	m		<b>~</b>	<u>ب</u>	n ug/L	χ,	·1 •		<b>^</b> •
Tetrachloroethene	. س	1/6n n	-,	<b></b> ,		<b></b> ,	<b>-</b> ,	7 20 2	
	<del></del> 1		<b>-</b> - 1	- 1		1	- ^		<b>-</b> N
	m i		ו מי	<b>√</b> 11	U U9/L	<b>1</b> P	3 6		7 M
trans-1,3-Dichloropropene	m +	7/6n n	v) +	<b>n</b> -	7/60 0	o •-	o	7/80 =	- ،
	- r		- 1	- 14	7/60	- r	- 14		· M
C15*1,5*Ulchloropropene	<b>0</b> •	7 da 7.	۰.	<b>.</b>		,	٠ ١		
	-					,-	-	7/52	_

SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22	tab Samp Project	le Number: Sample Num	tab Sample Number: 17709-18 Project Sample Number: SW-1	Lab Sampl Project S	e Numb	Lab Sample Number: 17709-19 Project Sample Mumber: SW-2	tab Samp Project	tab Sample Number: 17709-20 Project Sample Number: SW-3	17709-20 er: SW-3	
Lab Analysis by Laucks Testing Labs	1001		Lowest	Toct		Lowest	Test		Lowest Level of	
KI Data July 1909	Results	Flag Units	Detec	Results	Flag Units	Detect		Flag Units	Detect	
SEMIVOLATILES	(	:	(	(	:		,		·	
Phenol	~ <del>•</del>	765.5	7 01	, Ç	7/60 n		<b>,</b> F	7/60	<b>,</b>	
Aniline Dis/2-shloroethyllother	2 ~	7/80	2 ~	2 ~	1/60 1		2 ~	7/60 O	2 2	
2-Chlorophenol	: 0	1/6n n	. ~	۰~	) 60 D		8		2	
1,3-Dichlorobenzene	7	J/gn n	~	2	U ug/L		~ (		~ `	
1,4-Dichlorobenzene	~ 0	ر الاور الاور	~ (	~ (	) 60 :		N (1	1/6n n	~ ~	
Benzyl Alcohol	N C	7/6n n	<b>~</b> (	<b>v</b> (	60 :		<b>,</b> c	7/65 0	۰,	
1, Z-U1chlorobenzene	<b>u</b> 0	760 0	,,	<b>,</b> ,	7 6		٠,		۰.	
S-reculy(pieno) Bis(2-chloroisopropyl)ether	۰ ۵	7/60	۰ د	10	1/6n n		. ~		. ~	
4-Methylphenol	2	7/6n n	~	2	1/6n n		2	U ug/L	2	
N-Nitroso-di-n-propylamine	2	u ug/L	۷.	2	7/6n n		۰ ح		۰ 2	
Hexachloroethane	<b>4</b> (	U ug/L	<b>7</b> (	<b>4</b> (	7/6n n		4 (	1/6n n	<b>4</b> (	
Nitrobenzene	∾ (	7/6n n	<b>~</b> c	<b>7</b> (	7/60 0		v 0	0 09/1	, ,	
Isophorone	<b>y</b> ,	7/65	<b>v</b> <	<b>v</b> •			<b>4</b> 4	7/80	1 4	
2 C.D.methylohenol	1 C	7/65	۰ ۲	r (\	1/6n n		N	1/6n n	. ~	
Benzoic Acid	.05	n ug/L	20	20	n ng/r		20		50	
Bis(2-chloroethoxy)methane	2	1/6n n	2	~	1/6n n		۰ د		~ -	
2,4-Dichlorophenol	<b>4</b> (	1/6n n	4 (	4 (	7/6 0		<b>4</b> (	U ug/L	<b>1</b> (	
1,2,4-Trichlorobenzene	~ `	7/6n n	<b>V</b> V	<b>V</b> V	1/6n n		v 4		<b>u</b> 4	
Naphthalene	<b>.</b> .	7,67	10	<b>1</b> 0	7/65 -		۰ ۸		۰ ۸	
4-tn(oroanitine Hovachtorokutadiene	, v	1/6n n	٠	<b>.</b> ~	7/60 O		. ~	1/6n n	. ~	
4-Chloro-3-methylphenol	٠ ،	7/65 O	. •	1 2			3	1/6n n	7	
2-Methylnaphthalene	ح.	U ug/L	~	2	1/6n n		2		~	
Hexachlorocyclopentadiene	4	1/6n n	4	4	7/6n n		<b>4</b> ·		<b>.</b>	
2,4,6-Trichlorophenol	4	U ug/L	<b>4</b> ·	4.	7 rg/r		3 .	0 ug/t	<b>.</b>	
2,4,5-Trichlorophenol	4 (	1/6n n	<b>2</b> (	<b>2</b> 0	7/60 0		1 V	7/60 0	۰ ۲	
Z-uitoronaphthatene	<b>v</b> <	7/60 0	<b>u</b> ~	<b>y</b> 7	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		1 4	1 09/1	ı 4	
Z-Nitroanatine nimethylchthalate	<b>1</b> V	1/60 1	: <i>(</i> \	r (\	3 2		· N	1/6n n	. ~	
Acenachthylene	. ~	1/6n n	. ~	2	U 19/1		~		2	
2.6-Dinitrotoluene	4	U ug/L	7	7	א משיל		7		<b>.</b>	
3-Nitroanaline	10	1/6n n	10	2	1/6n n		٠ و		۶,	
Acenaphthene	~ ?	1/65 n	~ ~	~ 6	765		۰۶	0 09/L	~ ²	
2,4-Dinitrophenol	₹,	7/65 0	2 6	2 6	7/60 =		2 F		3.5	
4-Nitrophenol	2,	7,60	S	3 ~					2 5	
2 4-Digitrotolnese	1 4	1/6n 0	ı <b>-</b> 7	1 7	1/5n n		•		7	
Diethylphthalate	۰ ۲۷	U ug/L	2	~	J/go U		2		2	
4-Chlorophenyl phenylether	~	U ug/L	2	2	ug/L		2		~ `	
Fluorene	2	U ug/L	2	~	7/gn n		2.	7/6n n	~ ~	
4-Nitroaniline	•	U ug/L	<b>4</b>	7 (	- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1		4 6	1/6n n	<b>3</b> 6	
4,6-Dinitro-2-methylphenol	≅,	n ug/L	۰,	ς,	1,617 1,617		3,	7/60 0	3 ~	
1 2 Simple of the second of th	<b>V</b> •	0 ug/L	<b>,</b> ,	<b>y</b> 4	7 6 5		<b>.</b> 4		. 7	
1,2-01phienythydiad ine	<b>;</b> ~	7(5) -	۲ ۷	r <b>-</b> 3	1 00/1		. 4		• • •	
4-bi diopicity ( pieny terner Rexachlorobeczene	۰ ۸	1/60 O	~	2	1/6n n		~		2	
Pentachlorophenol	50		20	50	n ug/L		ଛ		20	
Phenanthrene	~:		~ 0	2 (	n 09/L		<b>~</b> r	7/6n n	<b>,</b> c	
Anthracene	~ (		~ (	<b>,</b> (	1/6n n		۰,۰	1,001	٠,	
DI-n-butylphthalate Fluoranthene	۰,	7/60 0	· ~	u ~	765 7	ں ب	۰ د		. ~	
Pyrene	۰ م		. 2	2	1/6n n		2	U 19/L	2	
Benzidine	20	U ug/L	20	20	7/6n n		20	U ug/L	, 20	
8utylbenzylphthalate	~ ?	1/6n n	~ ~	~ ~	) 65 =	<b>.</b> .	√.⊱	1,60,0	20	
5, 5' -Dichloropenziaine	Ŋ	O ug/L	0.7	2	3	3	3	1	2	

SAIC IRP Project - Joe Foss Field	Lab Sample Number: 17709-18	Number:	17709-18		le Number:	Lab Sample Number: 17709-19	Lab Sampl	Lab Sample Number: 17709-20	17709-20
SAIC Project No. 01-827-03-769-22	Projec: Sam	ple Numb	er: SW-1		Sample Numb	er: SW-2	Project S	ample Numb	er: SW-3
Lab Analysis by Laucks Testing Labs			Lowest			Lowest			Lowest
RI Data July 1989	Test		Level of	Test		Level of	Test		Level of
	Results Fl	ag Units	lag Units Detection	<b>Results</b>	Flag Units	Flag Units Detection	Resul ts	Flag Units Detection	Detection
Benzo(a)anthracene	~	U ug/L	~	2	7/6n n	~	2	U ug/L	2
Chrysene	~	U ug/L	2	2	7/6n n	2	2	U ug/L	2
Bis(2-ethylhexyl)phthalate	23	ng/L	~	=	ug/L	2	7	1/6n	2
Di-n-octylphthalate	~	U ug/L	~	2	U ug/L	~	7	U ug/L	2
Benzo(b) fluoranthene	•	U ug/L	7	7	U ug/L	4	7	n ng/L	7
Benzo(k)fluoranthene	<b>4</b>	U ug/L	7	7	1/6n n	7	7	U ug/L	7
Benzo(a)pyrene	•	U ug/L	•	4	U ug/L	•	7	U ug/L	7
Indeno(1,2,3-c,d)pyrene	•	U ug/L	7	4	U ug/L	7	7	U ug/L	7
Dibenzo(a,h)anthracene	4	n ug/L	7	4	n ug/L	<b>4</b>	4	U tig/L	7
Renzo(a h i )nervlene	7	U ua/L	7	7	U ud/L	7	7	U too/I	7

SAIC 1RP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22	Lab Sample Project Sar	e Number:	Number: 17709-4 nole Number: GW1-1	Lab Sample Number: 17709-5 Project Sample Number: GW1-3	e Number: emple Numb	17709-5 er: GW1-3	Lat Sample Number: 17709-6 Project Sample Number: GW1-4	Sample Number: 17709-6 ect Sample Number: GW1	17709-6 er: GW1-4	Lab Sampl Project S	e Number:	Lab Sample Number: 17709-7 Project Sample אנהצאנ: Gul-יי
Lab Analysis by Laucks Testing Labs Ri Data July 1989	Matrix: WATER Assoc Sample(s	WATER ple(s):	E8-15, 18-9, F8-3	Matrix: WATER Assoc Sample(s):	JATER Sle(s): E T	EB-15, TB-9, FB-3	Matrix: W Assoc Samp	: WATER Sample(s): El T	E8-15, T8-9, F8-3	Matrix: Assoc Sam	Sample(s): E	EB-15, TB-9, FB-3
PETROLEUM HYDROCARBOMS	Test Results 0.5	Flag Units U mg/L	Lowest Level of S Detection 0.5	Test Results 0.8	Flag Units mg/L	Lowest Level of Detection 0.5	Test Results F 1.3	Flag Units mg/L	Lowest Level of Detection 0.5	Test Results 2.2	Flag Units mg/L	Lowest Level of Detection 0.5
INORUANICS Arsenic	δ.	U ug/L	2	'n		5	<u>د</u>		s :	ر د	U ug/L	໌ ທ :
Lead(by ICP)	¥.	7/6w n	<u> </u>	<del>-</del> -	1 mg/L	¥-	¥-	U mg/t	<b>=</b> -	¥ C	1/gu n	<u> </u>
Leadlby uraphite furnace)	- 12		- 12	- 12		- <del>\</del>	-	U mg/L	- <del>I</del> Z	)   		- H
Sodium	=		=	×			N.		H	i z		H
Calcium	F.	U mg/L	¥	X.		=	노		<b>H</b>	<b>2</b>	U mg/L	H.
Kanganese	날		<b>;</b>	=	7/6# n	<b>-</b>		7/6w ::		- t		- F
Iron Iotal Sugardad Solids	Z 2			<b>;</b>			= =	1/6m 1	i	2 12		; ;
Total Discolved Solids	2 7			=		: =	: h		=	<b>.</b>		<b>X</b>
Chloride	<b>=</b>		=	<b>1</b>		H	1		12	Ħ		X
Nitrate	Z		H	×		<b>=</b>	1		<b>=</b>	= :		<b>=</b> :
Sulfate	<b>Z</b> :	7/6w n	<b>=</b> :	<b>-</b>	1/6w n			1/5# n		<b>=</b>	7/6w 5	Z 7
Total Alkalınıty	Z :		- F			<b>.</b>	ē 5		£ 3	E 3		: <u> </u>
Bicarbonate Alkakinity	ž		2 2	= =		: h:	2 2				U 1967	: h
Caroxiale Alkacini Ly	<b>:</b>		<b>=</b>	: <del>'</del>	_	i k	<b>.</b>		<b>.</b>	Ħ		N.
VOLATILE ORGANICS	•		•	•	701	-		1,00.11	-	-	1/041	-
Chloromethane .		7/60 =			7/60 1			_		. ,	_	۔ ۔۔
Viovi Chloride						-	_		-	_		-
Chloroethane	m		m.	M.	1/6n n	m·	m·		m·	m·	U ug/L	M ·
Methylene Chloride	<b></b> (		L	<b></b> u			- 4	7/65 2	- v	<b>v</b>	7/60	- v
Acetone,	Λ·	7/60	n <del>-</del>	n <del>-</del>	769	n ~	- ٥	7/6	٠-	o <del></del>	ת מפיר	٠-
Carbon Disurtice	- (-											-
1,1-Dichloroethane						-	-		_	<b></b> -		<b>-</b>
trans-1,2-Dichloroethere	-		-	_		<b>~</b>	<b>.</b>		<b>,</b>	·- ·		<b></b> ,
cis-1,2-Dichtoroethene	<del></del> -	7 5 5 7	<b>,</b> ,.		ار الاراد الاراد	<b></b>		7/60 =			7/80 5	- <b>-</b> -
total-1,Z-Dichloroethene Chloroform				- ,-								-
2-Butanone	·M		m	m		m	M		<b>.</b>	m	U ug/L	m,
1,2-Dichloroethane	<b>-</b>		<b>,</b> ,	<b></b> ,		<b>.</b> .	<b>-</b> .	7/60 n		<b></b>		
1,1,1-Trichloroethane		76.5			7 5 5 5 5 5			7/8/1	- ,	- ,-	0 0 0 0/2	
Vinyl Acetate			- +-					1/8n n		<b>-</b>		_
Bromodichloromethene			<b>,-</b>	-		-	_		-		1, ug/L	
1,2-Dichloropropane	<del>-</del> - (		<b>.</b> .	<b>-</b> ,	n ng/L	<del>-</del> ,	<b>-</b> .	7/85 = 1	<b></b> -	<b></b>	760 =	<b></b>
Trichloroethem	<b>-</b> ,		<b></b> •			<del>-</del> •		7/60 5				• •-
Benzene	- M	769	- r	- r	7/60	- M	- M		- M	· M		- M
Dibromochloromethane 1 1 2-Trichloroethane	o		) <del></del>	۱		<b>)</b>	, <del></del>		,			·
Bromoform				-		-	-		(	÷.		<b>-</b> ,
4-Hethyl-2-Pentanone	м		m	wı		W I	M t		M 14	<b>113</b> 14	7/60 n	~1 ~
2-Hexanone	M I		W t	m m		M 1-	41 CF	7/6n n	<b>1</b> K	<b>0</b> M	1 197	<b>^ ~</b>
1,1,2,2-Tetrachloroethane	M -	769	v)	<b>1</b> -	7 60 50	<u></u> ۲	o		<b>1</b> ←	<b>, -</b> -		۱
jetrach (oroethere Toliose	- (-								_	_		
Chlorobenzene	·M		m	м		ĸ	m	U ug/L	mı	m t	7/6n n	m,
trans-1,3-Dichtoropropene	м	u vg/L	м	м		m	m	1/6n N	•	<b>n</b>	U ug/L	n

Lab Sample Numbor: 17709-7 Project Sample Numbor: Gu1-40 Matrix: WAIER Assoc Sample(s): EB-15, 18-9, 18-9, 18-7, 18-10, 19-11, 19-11, 2-19-11, 2-19-11, 2-19-11, 2-19-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11, 3-11	
Lab Sample Number: 17709-6 Project Sample Number: Gul-4 Harrix: WATER Assoc Sample(s): EB-15, TB-9, FB-3 Lowest Test Level of Results Flag Units Detection 1 U ug/L 1 3 U ug/L 1 1 U ug/L 1 3 U ug/L 1 3 U ug/L 1	
ab Sample Number: 17709-5 Project Sample Number: GW1-3 Aarrix: WATER Assoc Sample(s): EB-15, FB-3, FB-	
Lab Sample Number: 17709-4, Le Project Sample Number: GW1-1 F Assoc Sample(s): EB-15, FB-3, FB-3, FB-3, Lowest Test Level of F Results Flag Units Detection F B U ug/L 1 1 1 U ug/L 1 1 1 1 U ug/L 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis Ly Laucks Testing Labs RI Data July 1989 Ethylbenzene cis-1,3-Dichlcropropene Tatal Xvlenes	SEMIVOLATILES Phenol Aniline Bis(2-chlorobenzene Benzyl Alcohol 1,4-Dichlorobenzene Benzyl Alcohol 1,2-Dichlorobenzene Benzyl Alcohol 1,2-Dichlorobenzene 2-Methylphenol N-Mitroso-di-n-propylamine Haxachloroethane Nitrobenzene 1.5-Dichloroethane Nitrobenzene 1.5-Dichloroethane 1.5-Dichloroethane 1.5-Dichloroethane 1.5-Dichloroethane 1.5-Dichloroethane 2-Mitroso-di-n-propylamine 1.5-4-Trichloroenzene 1.5-A-Trichloroenzene 1.5-A-Trichloroenzene 1.5-A-Trichloroenzene 1.5-A-Trichloroenzene 1.5-A-Trichloroenzene 1.5-A-Trichloroenzene 2-Mitroanaline 2-Mitroanaline 2-Mitroanaline 2-Dinitrotoluene 2-Dinitrotoluene 2-Dinitrotoluene 3-Mitroanaline 2-Dinitrotoluene 3-Mitroanaline 2-Dinitrotoluene 3-Mitroaniline 4-Dinitrophenol 1,2-Dinitrotoluene 1,2-Dinitrotoluene 1,2-Dinitroaniline 4-Dinitroaniline 2-Dinitroaniline 1,2-Diphenylhydrazine 1-Diphenylhydrazine 1-Diphenylhydrazine 1-Diphenylhydrazine 1-Diphenylhydrazine 1-Diphenylhydrazine 1-Diphenylhydrazine 1-Diphenylenol

r: 17709-6 Lab Sample Number: Umber: GW1-4 Project Sample Num Matrix: UATER EB-15, Assoc Sample(s): TR-9	ġ.	Level of Test Level of Flag Units Detection Results Flag Units Detection	2 2 G	n z z z n	U ug/L 2 2 U ug/L 2,	m. 2	ng/L 2 3 ng/L 2	n n8/r 20 20 n n8/r 20	U ug/L 2 2 U ug/L 2	. 20 20 u	. 2 2 C	. 2 2 U	ng/L 2 14 ng/L 2	U ug/L 2 2 U ug/L 2	η 7 7 7	7 1/6n n y + 7/6n n	1 ng/L 4 4 U ug/L 4	0 mg/l 4 4 U mg/L 4	7 1/6n n 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	0 mg/L 4 4 U mg/L 4
Lab Sample Numbo Project Sample M Matrix: WAIER Assoc Sample(s):	ı	Test Results F	~	2	~	4	-1	20	~	20	2	~	17	2	4	4	4	4	4	4
Lab Sample Number: 17709-5 Project Sample Number: GW1-3 Matrix: WATER Assoc Sample(s): E8-15,	FB-3, FB-3, Lowest	Level of Flag Units Detection	ng/L 2	ng/L 2	0 ug/L 2	ng/L 2	ug/L 2	n ng/L 50	U vg/L 2	U vg/L 20	ug/L 2	ug/L 2	ng/L 2	U 29/L 2	7 /5n n	7 n ng/L 4	7/5n n	7 ng/L 4	U ug/L 4	7 7/6n n
Lab Sam Project Matrix: Assoc S		Test Results	Φ.	7	7	9	٥	20	7	2	~	2	m	2	4	4	7	4	4	7
Lab Sample Number: 17709-4 Project Sample Number: GWI-1 Matrix: WATER Assoc Sample(s): E8-15,	. œ	Lest Results Flag Units Detection	n ng/L 2	U ug/L 2	U ug/L 2	U ug/L 2	U ng/L 2	n ng/L 50	U ug/L 2	1 U US/L 20	U ug/L 2	U vg/L 2	ng/L 2	U ug/L 2	7 n ng/L 4	7 7/6n n	7 1/6n N	7 7/5n n	7 7/6n n	7 7/5n n
SAIC IRP Project - Joe Foss Field La SAIC Project Ho. 01-827-03-789-22 Pr Lab Analysis by Laucks Testing Labs Ma RI Data July 1989	,	Te	Phenanthrene 2	Anthracene 2	Di-n-butylphthalate 2	Fluoranthene 2	Pyrene 2	Benzidine 50	Butylbenzylphthalate 2	3,3'-Dichlorobenzidine 20	Benzo(a)anthrucene 2	Chrysene	Bis(2-ethylhenyl)phthalate 3	Di-n-octylphthalate 2	Benzo(b)fluoranthene 4	Benzo(k)fluoranthene 4	Benzo(a)pyrene 4	Indeno(1,2,3-c,d)pyrene 4	Dibenzo(a,h)anthracene 4	Benzo(g,h,i)parytene

SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data July 1989	Lab Sample Project Sam Matrix: WA Assoc Sampl	e Number: 17709-8 Sample Number: GW1. WATER mple(s): EB-15,	Number: 17709-8 mple Number: GW1-5 TTER (e(s): EB-15,	Lab Sample Numbe Project Sample N Matrix: WATER Assoc Sample(s):	Sample Number: 17709-9 ect Sample Number: GW1 ix: WAFER c Sample(s): EB-15,	Lab Sample Number: 17709-9 Project Sample Number: GW1-6 Matrix: WATER Assoc Sample(s): EB-15,	Lab Sample Number: 17709-10 Project Sample Number: GW1-7 Hatrix: WATER Assoc Sample(s): EB-15,	Sample Number: 17709-10 ect Sample Number: GW1- ix: WATER c Sample(s): EB-15,	: 17709-10 nber: GW1-7 EB-15,	Lab Sample Numbe Project Sample N Matrix: WAIER Assoc Sample(s):	ü 5	: 17709-11 mber: GW1-8 EB-15,
PETROLEUM HYDROCARBONS	Test Results 0.5	Fi Flag Units U mg/L	3-3, Lowest Level of Detection 0.5	Test Results 0.5	FE Flag Units U mg/L	B-7, LOWEST Level of Detection 0.5	Test Results 6 0.5	FE Flag Units U mg/L	B-3, Lowest Level of Detection 0.5	Test Results 0.5	FE Flag Units U mg/L	B-3, Lowest Level of Detection 0.5
Arsenic Lead(by ICP) Lead(by ICP) Lead(by Graphite Furnace) Hagnesium Sodium Calcium Sodium Calcium Inda Suspended Solids Total Suspended Solids Total Dissolved Solids Chloride Nitrate Sulfate Sulfate Sulfate Notatal Alkalinity Garbonate Alkalinity Garbonate Alkalinity Ph VOLATILE ORGANICS Chloromethane Bromomethane Rethylene Chloride Carbon Disulfide 1,1-Dichloroethene Carbon Disulfide 1,1-Dichloroethene Carbon Trans-1,2-Dichloroethene Carbon Trans-1,2-Dichloroethene Carbon Tetrans-1,2-Dichloroethene Carbon Tetrans-1,2-Dichloroethene Carbon Tetrans-1,2-Dichloroethene Chloroform Chloroform Chloroform Chloroform Chloroform Chloroform Chloroform Chloroform Chloroethene Carbon Tetrachloride Vinyl Acetate Bromodichloroethene Carbon Tetrachloroethene Chloroform Chloroform Chloropropane 1,2-Dichloroethene Carbon Tetrachloride Vinyl Acetate Bromodichloroethene Carbon Tetrachloroethene Carbon Tetrachloride Vinyl Acetate Bromodichloroethene Carbon Tetrachloride Social Carbon C		U ug/L U			7/66 n n n n n n n n n n n n n n n n n n		~Z-Z-Z-Z-Z-Z-Z-Z-Z-Z-Z-Z-Z-Z-Z-Z-Z-Z-Z-		~Z-ZZZZZZZZZZZZZZZ	~ X-X-X-X-X-X-X-X-X-X-X-X-X-X-X-X-X-X-X-	7/56 n n n n n n n n n n n n n n n n n n n	02-1211111111111w-ww
Dibromochloromethane 1,1,2-Trichloroethane Bromoform 4-Methyl-2-Pentanone 2-Hexanone 1,1,2,2-Terrachloroethane Ictrachloroethene Toluene Chlorobenzene trans-1,3-Dichloropene	менмимении		พะะพพพะะพพ	พ๛๛พพพ๛๛พพ		мммммм	พ๛๛ฅ๛๛๛๛๛	7/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0 17/60 0	меемммеемм	ท — — ฅฅฅ — — ฅฅ	7/6n n 7/6n n 7/6n n 1/6n n 1/6n n 1/6n n 1/6n n 1/6n n 1/6n n	ภ <b>ะ</b> -พพพะ-พพ

SAIC IRP Project - Joe Foss Field SAIC Project Wo. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data July 1989  Ethylbenzene cis-1,3-Dichloropropene Styrene Total Xylenes SEMIVOLATILES Phenol Aniline Bis(2-chlorobenzene Benzyl Alcohol 1,3-Dichlorobenzene Benzyl Alcohol 1,4-Dichlorobenzene Benzyl Alcohol 1,2-Dichlorobenzene Benzyl Alcohol 1,2-Dichlorobenzene Benzyl Alcohol 2,4-Dichlorobenzene Benzyl Alcohol 2,4-Dichlorobenzene Benzyl Alcohol 2,4-Dichlorobenzene Bis(2-chloroisopropyl) ether A-Wethylphenol Bis(2-chloroisopropyl) ether A-Wethylphenol Bis(2-chloroethane Nitrobenzene 2,4-Dichlorophenol 3,4,5-Trichlorophenol 2,4-Dichlorophenol 2,4-Dinitrophenol 3-Mitrophenol 3-Mi	Lab Sample Project Sample Project Sample Assoc Sample Assoc Sample 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	### Number   Number	Number: 17709-8  ITER (c(S): E8-15, 18-9, 18-9, 18-9, 18-9, 18-9, 18-9, 18-9, 18-9, 18-9, 18-9, 18-9, 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 19-9/ 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MATER  MATER  MATER  MATER  FB-3,  1048-15,  1048-15,  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  1048-11  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1048-11  1048-11  104	Lab Sample Recipion 1	Example Number: 17709-10  XX: UATER  Sample(S): EB-15,  TB-9,  FB-3,  FB-3,  FB-3,  FB-3,  FB-15,  TOWEST  LOWEST  LOW	17709-10  EB-15, FB-3, F	Lab Sample Project Sample Project Sample Project Sample Sa	in the state of th	17709-11 18-15, 18-3, 18-3, 18-7, 18-7, 19-9, 10-10-10-10-10-10-10-10-10-10-10-10-10-1
2,4-Dinitrotoluene Diethylphthalate 4-Chlorophenyl phenylether Fluorene 4,4-Dinitro-2-methylphenol N. Nitrosodiphenylamine 1,2-Diphenylhydrazine 4-Bromophenyl phenylether Hexachlorobenzene Pentachlorophenol	500020000000000000000000000000000000000	7/6n n n n 7/6n n n n 7/6n n n n 1 7/6n n n n n n 1 7/6n n n n n n n 1 7/6n n n n n n n n n n n n n n n n n n n	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	มีกรรกกรรคทา		. ทดดา ถึด4 4 คนี	20072007700		20044084000

SAIT 180 Desiret - Joe Foss Field	John Samo	e Number:	17709-8	Lab Samo	ab Sample Number: 17709-9	17709-9	Lab Samo	ab Sample Number: 17709-10	17709-10	Lab Samol	ab Sample Number: 17709-1	17709-11
SAIC Project No. 01-827-03-769-22	Project S	Project Sample Number: GW1-5	er: GW1-5	Project (	Sample Num	Project Sample Number: GW1-6	Project	Sample Num	Project Sample Number: GW1-7	Project S	Project Sample Number: GW1-8	er: 641-8
Lab Analysis by Laucks Testing Labs	Matrix:	WATER		Matrix:	WATER		Matrix:	WATER		Matrix: WATER		
RI Data July 1989	Assoc Sample(	mple(s): E	8-15,	Assoc Sar	(ssoc Sample(s):	EB-15,	Assoc Sa	Assoc Sample(s):	EB-15,	Assoc San	Assoc Sample(s): E	£8-15,
			8-9			18-9.			.6-9		_	8-9,
		•	F8-3			FB-3			FB-3		4.	FB-3
			Lowest			Lowest			Lowest			Lowest
	Test		Level of	Test		Level of	Test		Level of	Test		Level of
	Results Flag	Flag Units	Detection	<b>Results</b>	Flag Units	s Detection	Resul ts	Flag Unit	lag Units Detection	Results	Flag Units	Detection
Phenanthrene	2	1/6n n	2	2	U ug/L	2	2	n ug/L	2	2	n vg/L	2
Anthracene	2	n ug/L	2	7	U ug/L	~	7	1/gn n	2	~	n ug/L	2
Di-n-butylohthalate	2	J/Bn n	2	2	n ug/L	~	2	U ug/L	2	2	U vg/L	ň
Fluoranthene	2	U ug/L	2	7	n ug/L	7	~	n ng/r	2	2	U ug/L	2
Pyrene	~	U ug/L	~	2	U ug/L	2	2	U ug/L	2	7	n ng/L	2
Benzidine	S	U ug/L	20	20	U ug/L	20	25	U ug/L	25	51	U ug/L	22
Butylbenzylphthalate	~	U ug/L	2	2	U ug/L	2	7	n ng/r	2	~	n ng/L	
3.3'-Dichlorokenzidine	2	U ug/L	20	50	U ug/L	20	21	n ug/r	21	20	7/6n ∩	20
Benzo(a)anthricene	2	1/6n n	7	2	U vg/L	2	2	J/8n n	7	7	n ug/L	2
Chrysene	~	U Ug/L	2	2	U ug/L	2	~	ני מפ/ר	7	7	7/8n n	~

SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22	Lab Samp Project	Lab Sample Number: 17709-12 Project Sample Number: GW1-	Lab Sample Number: 17709-12 Project Sample Number: GW1-10	Lab Sampl Project S	Sample Number: 17709-13 ect Sample Number: GW1-	Lab Sample Number: 17709-13 Project Sample Number: GW1-100		e Number: Jample Num	Sample Number: 17709-14 ect Sample Number: GW1-11		Lab Sample Number: 17709-15 Project Sample Number: GW1-	17709-15 er: GW1-12
Lab Analysis by Laucks Testing Labs RI Data July 1989	Matrix: WATE Assoc Sample(	WATER ample(s):	E8-15, TB-9, F8-3	Matrix: Assoc San	: WATER Sample(s): E	E8-15, 18-9, F8-3		:: WATER Sample(s):	Matrix: WAĬER Assoc Sample(s): EB-15, IB-9, FB 3	Matrix: Assoc San	Matrix: Water Assoc Sample(s): EB-15, TB-9, FB-3	EB-15, TB-9, FB-3
	Test Results	Flag Units			Flag Units	Level of S Detection	Test Results	Flag Units	Lowest Level of S Detection		Flag Units	Lowest Level of Detection
PETROLEUM HYDROCARBONS .	0.5	ີລ	0.5	0.5	U mg/L	0.5	0.5	U mg/L	0.5	1.2	T/6ш	0.5
INORGANICS Arsenic	۲۸	U ug/L	s	ĸ		٧.	'n		ı۸	50	U9/L	5
Lead(by ICP)	Ξ.		, T	¥.	U mg/L	¥.	<b>.</b>		¥.	× -	U mg/L	<b>×</b> ,
Lead(by braphite rurnace) Magnesium	- =	0 09/L	- 2	- 12	U mg/L	<del> </del>	- <u>1</u>	7/5m n	- L	<u>-</u> =	1, mg/L	- <del>'</del> =
Sodium	Z Z	U mg/L	×	<b>=</b>		I X	=		12	Z.		<b>=</b>
Calcium	<b>=</b> =	U mg/L	7 7	# H	1 mg/L	<u> </u>	<u> </u>	1/Bul 1	<u> </u>	Z 5	U mg/L	K K
Iron	ž	U mg/L	×	; <del>;</del>		<del>-</del>	: <b>'</b>		<b>X</b>	ž		: <del>'</del>
Total Suspended Solids	<b>=</b> :	U mg/L	F :	1		¥ :	<b>Z</b> 5		5 5	<b>1</b>		<b>#</b> #
chloride	£ 32	0 mg/L	ž ž	= =	משלר משלר	Z	ž Z		: <del> </del>	Z	7/EIII 7/	£ '=
Nitrate	, r	U mg/L	Ä	<b>*</b>		×	=		T T	Ħ		<del>_</del>
Sulfate Total Alvalinita	<b>5</b> 5	U mg/L	<u> </u>	<u> </u>	n mg/L	<b>Z</b> 2	= =	U mg/L	Z 5	<b>=</b> =		= =
Bicarbonate Alkakinity	: h:		ž	: =	7/2	=	: h		; <del>;</del>	; ;	U mg/L	: <del>-</del>
Carbonate Alkalinity	¥	U mg/L		Z	U mg/L	-	Ä		H	1		H
£	¥	Units		-	Units	H	¥	Units		=	Units	×
VOLATILE ORGANICS												
Chloromethane	<del></del>	U ug/L	-	<b>,</b>	U ug/L	<b>.</b>	<b></b>		<b>,</b> ,	<b>-</b>		<b>,</b> ,
Bromomethane	<b></b>	U ug/L	-,-	<b>,.</b> ,	ارور 1 م			7/65			7/6n =	,- <b>,</b> -
Chloroethane	- M	7/80 0	- M	- 141	7/80	- M	- M		- M	- M	7/80 0 0	- M
Methylene Chloride	<b>,</b>	U ug/L		<b></b> 1						<b>+-</b> - (		
Acetone Called Plantilla	ι <b>Λ</b> «	7/6n n	<b>L</b> O 4	vo +		ın e	v +	769.5	<b>^</b> ←	<b>^</b> ←		∿ <u>-</u>
tarbon bisurrice	- ,-	0 09/L 0 04/L	- ,	- ,	7/50 C C C					- ,	7/50 0 7/50	
1,1-Pichloroethane		U ug/L	-						<b>-</b>	<del>-</del>		_
trans-1,2-Dichloroethene	<b>-</b> •	7/6n n	<del></del>	<b></b> .	7/6n n	<del>-</del> •		7/gn n	·- ·	<b>+</b> +-	7/6/ n ::	<b>.</b> .
cis-1,z-bichiproethene total-1,2-bichloroethene		0 09/L						7/8 0 0 1/8 0			- 19/F	
Chloroform	. 4	U ug/L	-			· •••	<b>-</b>		<del></del> 1			
2-Butanone	ю.	ر الاور :	m •	M t	1/6n n	m.	<b>M</b> *	7/5 a	m <del>r</del>	<b>~</b> •	7/60 5	<b></b>
1,7-Dichloroethane		0 09/L		- ,-	7/80		- ,-					
Carbon Tetrachloride	_	U ug/L	<b>,_</b>	_	U ug/L	-	-		-	-		
Vinyl Acetate	<b>,</b> ,	U vg/L	<b>,</b>	<b>.</b> .		<b></b> ,	<b></b> 4		<b>,-</b> ,			<b>,-</b> ,
Bromodich(oromethane		7/67		(	7/60			7/60			1/60	-,-
Trichloroethere		. 1/gv U							· <b>-</b> -			
Benzene		1/6n n		<b>-</b> ,	U ug/L		-,			۰- ۲		<b>←</b>
Dibromochloromethane	ю <del>с</del>	U UG/L	w <del>-</del> -	m -		<b>ماد</b>	o t-	7/6n n	o <del>c</del>	a -	0 ug/L	<b>1</b> ←
Bronoform	- ,-	0 ug/L	- +-				٠,-					
4-Methyl-2-Pentanone	M	U ug/L	mı	ı رم		m i	m i		W t	m 11		<b>50</b> 10
2-Rexanone	MI	0 ug/L	M 14	M 14	U ug/L	<b>√1</b>	~ ^ ^	7/60 0	<b>1</b> H	<b>~</b> ~	0 ug/r	<b>1</b> ~
1,1,2,2-Tetrachloroethane Tetrachlocoethene	v	7/5n n	ი ←	o		<b>1 ←</b>	ი	0 09/L C 09/L	<b>1 ←</b>	າ <b></b> -		<b></b> ∩
Toluene		1/6n n					-		-	<b>-</b>	U ug/L	_
Chlorobenzene	м	U ug/L	×	3	U ug/L	m	m	U ug/L	mı	m i	U ug/L	M I
trans-1,3-Dichloropropene	m	1/6n N	m	ω.		M	'n	N ug/L	า	า	U vg/L	<b>~</b>

7709-15 r: Gul-12 r-15, r-9, Lowest Level of Detection 3 1	
: 17705 EB-15: 18-9, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-3, FB-	200000000000000000000000000000000000000
Lab Sample Number: 17709-15 Project Sample Number: Gul-12 Assoc Sample(s): E8-15, 18-9, 18-9, 18-1 Test Level of Results Flag Units Detection 38 U ug/L 1 1 U ug/L 1 350 ug/L 1	1/6n n n 1/6
	พลาย เกายายยยยยยยยยยยยยยยยยยยยยยยยยยยยยยยย
: 17709-14 EB-15, TB-9, Lowest Lowest Level of 13 1	กริกทยทยทยทยทาง เพลา ราย เพลา เพลา เพลา เพลา เพลา เพลา เพลา เพลา
Sample Number: 17709-14 ect Sample Number: GUI-1 ix: WATER ic Sample(s): EB-15, 18-9, 18-9, 18-9, 18-9, 18-9, 18-9, 18-9, 18-1, 19-9, 19-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9, 10-9	
Lab Sampl Project S Matrix: Assoc Sam Test Results 1	กรูกกดกดดดดดดงกรกรดรดรดรดรงกรรงรรษฐกิจรถกรดดงรถกรรด
: 17709-13 iber: Gul-100 EB-15, TB-9, FB-3 Lowest Level of Level of S Detection 1	200000000000000000000000000000000000000
Number: 1 ple Numbe IER e(S): EE FE FE B UG/L U UG/L U UG/L	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
Lab Sample Project Sam Matrix: WA Assoc Sampl Test Results F1 1	05000000000000000000000000000000000000
5 7.8	05000000000000000000000000000000000000
ber: 17709 : Number: 07709 :): E8-15, 18-9, 18-9, 18-9, 19-9, 10-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19-9, 19	
<b>င်း</b> မည်တို့ ညီဘီဘီဘီဘီ	777769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769 1 77769
Lab Sample Nu Project Sampl Matrix: UAIE Assoc Sample Iest Results Flag 1 U U	นอนทบทบทบทบางการบารการการการการการการการการการการการการกา
SAIC IRP Project - Joe Foss Field SAIC Project 10. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data July 1989  Ethylbenzene cis-1,3-Dichloropropene Styrene Total Xylenes	SEMIVOLATILES Phenol Anni ine Bis(2-chloroethyl)ether 2-chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene Benzyl Alcohol 1,2-Dichlorobenzene 2-Hethylphenol 2-Hethylphenol 1-sephorone 2-Hirobenzene 1-sophorone 2-witrophenol 2,4-Dichlorophenol 1,2,4-Trichloropenzene 4-chloroaniline Hexachloroburadiene 4-chloroaniline 4-chloroaniline 4-chloroaniline 4-chlorophenol 2,4-Dichlorophenol 2,4-Dichlorophenol 2,4-Dichlorophenol 2,4-Dichlorophenol 2,4-Dinitrotoluene 2,4-Dinitrotoluene 2,4-Dinitrotoluene 2,4-Dinitrotoluene Diethylphthalate 4-Klicophenol 2,4-Dinitrotoluene Diethylphthalate 4-Klicophenol 2,4-Dinitrotoluene Diethylphthalate 5,4-Dinitrotoluene Diethylphthalate 4-Nitroaniline 4-Nitroaniline 4-Siphenylbydrazine 4-Siphenylbydrazine 4-Siphenylbydrazine 4-Siphenylbydrazine 4-Bromophenyl phenylether Fluorene 4-Bromophenyl phenylether Hexachlorobenzene 4-Bromophenyl phenylether

SAIC INP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22	Lab Sample Number: 17709-12 Project Sample Number: GW1-10	Lab Sample Number: 17709-15 Project Sampl, Number: GW1-100	Lab Sample Number: 17709-14 Project Sample Number: GW1-11	Lab Sample Number: 17709-15 Project Sample Number: GW1-12
Lab Analysis by Laucks Testing Labs	Matrix: WATER		Matrix: WATER	Matrix: WATER
RI Data July 1989	Assoc Sample(s): EB-15,	Assoc Sample(s):	Assoc Sample(s): EB-15,	Assoc Sample(s): EB-15,
	, 6-81	18-9,		
	F8-3	FB-3	FB-3	FB-3
	Lowest	Lowest	Lowest	Lowest
	Test Level of	Test Level of	Test Level of	Test Level of
	Results Flag Units Detection	Results Flag Units Detection	Results Flag Units Detection	
Phenanthrene	2 U ug/L 2	~		2 U U9/L
Anthracene	2 U ug/L 2	2 n ng/L 2	2 U vg/L 2	2 0 09/1 2
Di-n-butylphthalate	2 n mg/L 2	2 U uq/L 2	2 n na/L 2	2 1/00/1 2
Fluoranthene	2 U ug/L 2	2 U ug/L 2	2 0 09/1 2	2 0 00/1 2
Pyrene	2 U ug/L 2	2 U ug/L 2	2 U U9/L 2	2 10 00/1 2
Benzidine	50 u ug/L 50	50 U ug/L 50	50 u vg/L 50	
Butylbenzylphthalate	2 0 ug/L 2	2 U ug/L 2	2 U ug/L 2	2 U vg/L 2
3,3'-Dichlorobenzidine	20 U ug/L 20	20 U ug/L 20	20 U ug/L 20	20 U ug/L 20
Benzo(a)anthracene	2 U ug/L 2	2 U ug/L 2	2 0 ug/L 2	••
Chrysene	2 U ug/L 2	2 n ug/L 2	2 n d ug/L 2	2 U vg/L 2
Bis(2-ethylhexyl)phthalate	2 0 mg/L 2	3 ug/L 2	2 0 0g/L 2	4 va/L 2
Di-n-octylphthalate	2 0 ug/L 2	2 U ug/L 2	2 0 ug/L 2	2 U ug/L 2
Benzo(b) fluoranthene	7 1/6n n 7	7 7/6n n 7	7 1/6n n 7	7 1/8c n 7
Senzo(k)fluorenthene	7 1/6n n 7	7 7/6n n 7	7 7/8n n 7	7 1/30 A 7
8enzo(a)pyrene	7 1/6n n 7	7 7/6n n 7	7 7/6n n 7	7 7/8n n 7
Indeno(1,2,3-c,d)pyrene	7 1/6n n 7	7 1/6n n 5	7 7/6n n 5	7 7/8n n 7
Dibenzo(a,h)anthracene	7 1/6n n 7	7 7/8n n 7	7 1/5n n 7	7 1/6n n 7
Benzo(i, h, i)perylene	7 7/6n n 7	7 7/8n n 7	7 1/3n n 7	7 7/80 A 7

SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs	Lab Sampl Project S Matrix:	le Number: Sample Num WATER	Lab Sample Number: 17709-16 Project Sample Number: GW1-13 Matrix: WATER	tab Sampl Project S Matrix:	Sample Number: 17709-16 ect Sample Number: GWI- ix: WATER	lab Sample Number: 17709-16 Project Sample Number: GW1-14 Matrix: WAIER	
Ri Data July 1989	ā		EB-15, TB-9,	Assoc Sample(s):	ple(s): E	E8-15, TB-9,	
	Test		Lowest Level of	Test	_	Lowest Level of	
PETROLEUM HYDROCARBONS	Results 0.5	Flag Units U mg/L		Results 0.5	Flag Units U mg/L		
INORGANICS							
Arsenic	ις :		ر ا	S	n ug/L	ر م	
Lead(by ICP)	<del>-</del>	D 19/L	<b>-</b>	<u>-</u> -		<u>-</u>	
Magnesica	- 12	0 0g/L	- ¥	- 4	7/60 0 0 mg/r	- 1	
Sodium	'n		H	I.R		1	
Calcium	달!		Έ!	<b>:</b>	n mg/L	<b>=</b> !	
Hanganese		7/6# n	2 3	Z 7	7/6w =	2 3	
Suspended	; <del>;</del>		: <u>+</u>	: <del>'</del>			
Total Dissolved Solids	<u> </u>		L .	<b>!</b>			
Chloride		1/6# n		<b>=</b> 1	U mg/L		
Sulfate			: \	: i-			
Total Alkalinity	N.		, E	<b>1</b>		H	
Bicarbonate Alkakinity	<b>=</b> !		<u> </u>	<b>:</b>		<b>=</b> !	
Carbonate Alkalinity	- L	T/BE C		<b>X</b> 2	U mg/L		
£.	Ē			Ē	OULES	Ē	
VOLATILE ORGANICS							
Chloromethane	<b>,-</b> ,	7/8n n	<b>-</b>	<b>-</b>	U ug/L	<b></b> ,	
Bromomethane			<b>,</b> ,	+	7/6 ∩ ::	<b></b> -	
Vinyl unfortage Chloroethane	- M	760	M	- 141	7 2/65	M1	
Methylene Chloride				·			
Acetone	<b>1</b> 0 •		ın •	<b>.</b>		ın r	
tarbon Disutioe		76.	- •-		760		
1, 1-Dichloroethane							
trans-1, 2-Dichloroethene	<b>,</b>		<b>,</b> ,	_		_	
cis-1,2-Dichloroethene	<b>,</b>	769.	<b></b> •		7/60 0		
Chloroform		7/80 03/1-		- ,	) 1/6 1/6		
2-Butanone	м		23	3		3	
1,2-Dichloroethane	<b></b> +	7/5 n :		<b></b> .	7/6n n	<b></b> .	
Carbon Tetrachloride							
Vinyl Acetate	<b>-</b>		-	<del>-</del>		-	
Bromodichtoromethane	<b>,-</b> ,		<b></b> .	<b>,-</b> ,		<b>.</b> - ,	
1,2-Dichloropropane	<b></b>	7/50 =			760	- •	
Renzene Renzene			- •-				
Dibromochloromethane	· 10	7/5n n	· m	- M	1/60 n	· w	
1,1,2-Trichloroethane	-		<del></del> ,	<b>,</b> ,		· •••	
Bromoform	-,		·- 1	·- 1		<b>.</b>	
4-Methyl-2-Pentanone 2-Nexanone	J K	7/64 0	1 K	9 K	7/60 0	<b>1</b> 1	
1,1,2,2-Tetrachloroethane	m		m	m		m	
Tetrachloroethene	_		<b>-</b>	_	n ug/L	<b>-</b>	
Toluene	h	7/69 0	<b></b> h	r	1/6n n	~- p	
Lntoropenzene trans-1,3-Dichloropropene	าพ	7/50 C C	าพ	าพ	7/6n n	าพ	
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Lab Sample Number: 17709-16 Project Sample Number: GW1-14 Matrix: WATER Assoc Sample(s): EB-15, FB-3	Test Level of Results Flag Units Detection 2 0 ug/L 2 2
Lab Sample Number: ;7709-16 Project Sample Number: GW1-13 Matrix: WATER Assoc Sample(s): EB-15, FB-9,	Test Level of Results Flag Units Detection 2 U ug/L 4 U u
SAIC IRP Project - Joe Foss Field SAIC Project No. 01-827-03-769-22 Lab Analysis by Laucks Testing Labs RI Data July 1989	Phenanthrene Anthracene Di-n-butylphthalate Fluoranthene Pyrene Benzidine Butylbenzylphthalate 3,3'-Dichlorobanzidine Benzo(a)anthracene Chrysene Bis(2-ethylhenyl)phthalate Di-n-octylphthalate Benzo(b)fluoranthene Benzo(c)fluoranthene Benzo(a)pyrene Indeno(1,2,3-c,d)pyrene Dibenzo(a,h)anthracene Benzo(a,h)anthracene

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SAIC IRP Project - Joe Foss Field	Lab Sample Number: 17709-1	mber: 17	1-6022	Lab Samp	Lab Sample Number: 17709-2	17709-2	Lab Samp	Lab Sample Number: 17709-3	17709-3
SAIC Project No. 01-827-03-769-22	Project Sampl	e Number	r: 18-9	Project	Sample Numi	er: F8-3	Project	Sample Numb	er: E8-15
Lab Analysis by Laucks Testing Labs		_	Lowest			Lowest			LOWEST
RI Data July 1989	Test	_	Level of	Test		Level of	Test		Level of
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Chrysene	U U	1/6n	12	m	U ug/L	m	2	U ug/L	2
Bis(2-ethylhexyl)phthalate	U U	1/60	12	м	U ug/L	m	2	ug/L	2
Di-n-octylphthalate	או	₹ 7/gn	Ħ	m	U ug/L	m	8	U ug/L	2
Benzo(b)fluoranthene	NT C	1/6n		'n	U ug/L	v	7	n ng/L	7
Benzo(k)fluoranthene	NT U		=	'n	U ug/L	'n	7	U ug/L	7
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CHAIN-OF-CUSTODY RECORDS

Laurente Laboratories, Inc. 940 Svultking St. Soule Washington 960 Svultking St. Soule Washington 9600 (2001)757 2000

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CHAIN OF CUSTODY RECORD

OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS M ZO OF CONFA-ZHER **TESTING PARAMETERS** ho SA 2 49 Volatiles (BHA) (man) 53 inaprio 7 J. Eric Gibson LOCATION SITE 51E (PRINTED NAME) 20122 4-11-81 1330 8 - 76 BI-1-15 4-11-89 1430 4-11-81 1330 8400 Westpark Dr. PROJECT NAME JOE FOSS FIELD Connie Samsen B1-1-25 4-11-69 Mc Lean, VA SAMPLE NO E8-1 T8-1 SAIC SAMPLER (SIGNATURE) ZAB NO. LAB SA # ATTENTION ADDRESS NAME d

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Testing Laboratories, Inc. 940 South Harrey St Seattle Washington 98108 (2003)767 5000

DATE 4-13-89

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Testing Laboratories, Inc. 940 Sauth Harray St. Scattle Washington 98108 (206)767 5060

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LAUCKS TESTING LABS

Testing Laboratories, Inc.

940 South Harney St. Scattle Washington 98106 (206)767 5060

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CHAIN OF CUSTODY RECORD

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940 Sewil Harrey St Scattle Washington 96106 (206)767 5060

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Testing Laboratories, luc.

940 Stuth Harney St. Seattle Washington 9608 (206)767 5060

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iScience Applications
International Corporation
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In Employee-Owned Company

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Appendix F:

QA/QC Program Evaluation, Chemical Analyses

#### APPENDIX F

### QUALITY ASSURANCE/QUALITY CONTROL PROGRAM EVALUATION

This section presents the laboratory Quality Assurance/Quality Control (QA/QC) results obtained in conjunction with the Remedial Investigation (RI) field activities and the significance of the QA/QC findings. A discussion of the QA/QC program and its associated results is presented in the following Appendix.

#### F.1 QUALITY ASSURANCE OBJECTIVES

#### F.1.1 Quality Assurance Objectives

Comprehensive quality assurance objectives for the Joe Foss Field RI project were developed to provide guidelines for all field and laboratory operations. The goal of the sampling and analysis effort was to produce data of known and acceptable quality, allowing the IRP team to fully assess the impact of past and present hazardous waste practices, to identify, quantify and delineate the extent of any contamination, and to develop preliminary alternative action plans. During the course of the RI, all activities and analyses were conducted using standard procedures described in the RI Quality Assurance Project Plan (QAPP) so that known and acceptable levels of precision, accuracy, representativeness, completeness, and comparability (PARCC) were documented. The results were produced using established methodology and standard operating procedures, and were reproducible at all levels. The following sections present a general assessment of the project Data Quality Objectives (DQOs).

#### F.1.2 Precision

Precision is defined as the reproducibility, or degree of agreement, among replicate measurements of the same quantity. The closer the numerical values of the measurements come to each other, the more precise the measurement. Analytical precision is expressed as a percentage of the difference between results of duplicate samples for a given compound or element. Relative percent difference is calculated as:

Precision = Relative Percent Difference =  $|C_1 - C_2|/[(C_1 + C_2)/C^*] \times 100$  percent

where:

 $C_1$  = Concentration of the compound or element in the sample

 $\hat{C_2}$  = concentration of the compound or element in the duplicate/replicate.

Precision was determined using duplicate samples (trace metal analyses), matrix spikes and matrix spike duplicates (MS/MSDs) for the analytical work performed at Joe Foss Field. The laboratory selected (for all organics analyses) one sample in 20 and split the sample into three aliquots. The first aliquot was analyzed routinely for the parameters of interest, while the other two aliquots were spiked with known quantities of the parameters of interest prior to analysis. The relative percent difference (RPD) between the two results was calculated and used as an indication of the precision of the analyses performed.

During the collection of data using field analysis methods and/or field instrumentation, precision was assessed by reporting several measurements taken at one location and comparing the results. Sample collection reproducibility was measured in the laboratory by the analysis of field replicates. Control limits for laboratory and field analyses are presented in the RI QAPP and Appendix F of this report.

Based on the evaluation of the field replicate results presented in Section F.2.1.4 and the duplicate sample and MS/MSD results presented in Sections F.2.2.2 and F.2.3.2, the overall field reproducibility and laboratory precision is acceptable.

#### F.1.3 Accuracy

Accuracy is defined as the degree of difference between measured or calculated values and the true value. The closer the numerical value of the measurement comes to the true value, or actual concentration, the more accurate the measurement is. Analytical accuracy is expressed as the percent recovery of a compound or element which has been added to the environmental sample at a known concentration before analysis. The equation used to calculate percent recovery is:

Accuracy = Percent recovery = 
$$(A_r - A_0)/A_f \times 100$$
 percent

where:

 $\begin{array}{l} A_r = \text{Total amount detected in spiked sample} \\ A_0 = A_{mount detected in unspiked sample} \\ A_f = A_{mount added to sample.} \end{array}$ 

Laboratory accuracy was assessed by evaluating method blank, surrogate recovery, initial and continuing calibration, and MS/MSD results calculated from the organics (i.e., volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs)) analyses and method and preparation blank, initial and continuing calibration, and matrix spike results calculated from the inorganics (i.e., trace metals and petroleum hydrocarbons) analyses.

Sampling accuracy was maximized by the adoption of, and adherence to, a strict QA program. All procedures conducted during the RI were documented as standard protocol and all equipment and instrumentation was properly calibrated and well-maintained. Trip blanks, field blanks, and equipment blanks were included in all sample batches to ensure that all samples were representative of the particular site from which they were sampled and to assess any cross-contamination that may have occurred. In this manner, deficiencies can be quickly documented and corrected. Specific control limit objectives for accuracy as pertaining to the RI at Joe Foss Field were presented in the RI QAPP. Based on the evaluation of the field QC blank results presented in Sections F.2.1.1, F.2.1.2, and F.2.1.3 and the laboratory QC blank, surrogate and MS/MSD, matrix spike, and initial and continuing calibration results presented in Sections F.2.2.2 and F.2.3.2, the overall field and laboratory accuracy is acceptable.

#### F.1.4 Representativeness

Representativeness is defined as the degree to which the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Sample representativeness was ensured during the RI by collecting sufficient samples of a population medium, properly distributed with respect to location and time. Representativeness was assessed by evaluating the RPD values calculated from field replicate samples and by evaluating the concentrations of interferents detected in the field QC blanks and laboratory blanks. The reproducibility of a representative set of samples reflects the degree of heterogeneity of the sampled medium, as well as the effectiveness of the sampling technique. Based on the evaluation of the field replicate results presented in Section F.2.1.4, field QC blank results presented in Sections F.2.1.1, F.2.1.2, and F.2.1.3, and laboratory blank results presented in Sections F.2.2.2 and F.2.3.2, the samples collected during the RI are considered to be representative of the environmental condition at Joe Foss Field.

#### F.1.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another and is limited to the other PARCC parameters; only when precision and accuracy are known can one data set be compared to another. Field and laboratory procedures greatly affect comparability. To optimize comparability, only the specific methods and protocols that were specified in the RI QAPP were used to collect and analyze samples during the RI at Joe Foss Field except for arsenic and selenium, which were analyzed using EPA Methods 7061 and

7741, respectively, rather than Methods 7060 and 7740, respectively. By using consistent sampling and analysis procedures, all data sets were comparable within a specific site at the Base, between sites at the Base, or among Department of Defense installations nationwide, to ensure that remedial action decisions and priorities will be based on a consistent data base. Comparability also was ensured by the analysis of USEPA standard reference materials, establishing that analytical procedures were generating valid data. Based on the precision and accuracy assessment presented in Sections F.1.2 and F.1.3, respectively, the data collected during the RI at Joe Foss Field are considered to be comparable with that collected during previous investigations.

#### F.1.6 Completeness

Completeness, for the purposes of the RI at Joe Foss Field, is expressed as the percentage of data used to prepare a baseline risk assessment and upon which recommendations for site remediation are based. For analytical data to be considered usable for risk assessment and remediation recommendations, they must be satisfactorily validated. Values and concentrations reported for all analyses conducted that are labeled with the laboratory or validation qualifier "R" (i.e., unusable) may not be used in risk estimates or for remediation recommendations. Based on an evaluation of the field and laboratory results, no data were determined to be unusable and, as such, were used in all baseline risk assessments and as the basis of all the recommendations presented in this report.

#### F.2 QUALITY ASSURANCE/QUALITY CONTROL PROGRAM

A program of the QA/QC procedures similar to those instituted throughout the Site Inspection (SI) were also adhered to during the Remedial Investigation (RI) conducted at South Dakota Air National Guard (SDANG), Joe Foss Field, Sioux Falls, South Dakota. The intent of this QA/QC program is to ensure that collected samples are representative of the sites, and that analytical data accurately describe the characteristics and concentrations of constituents in the samples. The QA/QC program consisted of the establishment of routine QC procedures throughout the program, as well as the preparation and analysis of both laboratory and field QA/QC samples. The field QC procedures, including trip blanks, field blanks, equipment blanks, and field replicates including a summary of procedures and equipment, and level C data validation and laboratory QA results are discussed in Subsection F.1.2. The QC procedures were defined for both groundwater and soil samples. Analytical results indicate a concentration of metals, volatile organics, semivolatile organics, petroleum hydrocarbons in both soil and water. Analyses were conducted for miscellaneous inorganics in water and total organic carbon was analyzed for in soils. A complete set of the analytical data and a QA/QC summary can be found in Appendices E and F, respectively.

#### F.2.1 Field Internal Quality Control Checks

Trip blanks, field blanks, equipment blanks, and field replicates were collected and analyzed along with environmental samples. These samples were intended as QC checks of the sample collection and handling procedures, as well as of equipment decontamination procedures.

During the groundwater and soil sampling field effort, the U.S. Environmental Protection Agency (EPA) guidelines required the use of reagent-grade water for blanks, as described in the EPA manual, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third Edition, 1986 (SW-846). All blanks (except trip blanks, which were prepared at Laucks Testing Laboratory and sent to SDANG) were prepared in the field using randomly selected sample containers from the same container supply that later would be used in transporting environmental samples from the site. Reagent-grade water was used to prepare these field check samples, regardless of the environmental medium because:

- Reagent grade water simulates the physical characteristics of groundwater and surface water.
- Reagent-grade water simulates a reproducible fraction (moisture) of soils and sediments.
- No reproducible, affordable material is available that simulates clay and the organic portion of soils and sediments.
- An organic or aqueous reservoir is necessary for the absorption, dissolution, or solvation of organic or inorganic contaminants.

All sample containers were provided by Laucks Testing Laboratory and were shipped with chain-of-custody records. These records were completed by field personnel and returned with the samples. The following QC samples were collected for each day of sampling:

- One trip blank per container per sampling team for every batch of volatile organic compound (VOC) samples (soil and water).
- One field blank per sampling team to be analyzed for the parameters of interest at any particular site.
- One set of equipment blanks for every day of soil sampling for analysis of all parameters. One bailer wash was collected for every 10 groundwater samples sent to the laboratory for analysis of all parameters.
- One field replicate for every 10 samples.

#### F.2.1.1 Trip Blanks

Trip blanks were prepared prior to the sampling trip by pouring reagent-grade water into prepared sample bottles. These sample bottles were randomly selected from the supply of prepared

sample bottles. Sample containers were filled and preserved to yield a representative blank for each type of VOC analysis, resulting in a complete trip blank for the sampling event. These trip blanks were prepared at Laucks Testing Laboratory, shipped to SDANG along with unused sample bottles, transported to the sites, and then shipped back to the laboratory with the environmental samples collected during the sampling event. The analysis results of trip blanks were used to assess the contamination of sample containers during transport to and storage at the site, to assess contamination of the samples during transport back to the laboratory, and to judge overall whether the contaminants detected in the environmental samples were contributed during transport or by sample containers or are representative of the present environmental condition at SDANG. One trip blank was included in each shipping container containing samples for VOC analysis. Nine trip blanks were analyzed for VOCs by Laucks Testing Laboratory. The results of the trip blanks are shown in Table F-1. A summary of the results can be found below:

- Three trip blanks (TB-7, TB-8, and TB-9) accompanied water samples collected at SDANG and were sent to Laucks Testing Laboratory to be analyzed for VOCs by EPA Method SW 8240. Acetone was detected in one sample, TB-9, with a concentration of 8 micrograms per liter (µg/L). Acetone was detected in environmental samples associated with TB-9 (GWI-4 and GWI-4DUP, 6 µg/L each) with concentrations less than TB-9; therefore, this contaminant had little impact on the overall data quality.
- Six trip blanks (TB-1 through TB-7, inclusive) were collected at SDANG and accompanied the soil samples to Laucks Testing Laboratory for VOC analysis. No contaminants were detected.
- The volatile compounds detected in the environmental samples represent the environmental condition of the location where collection occurred and are not present as a result of any external sources discussed previously.

#### F.2.1.2 Field Blanks

Field blanks were prepared at the beginning of each sampling event at each discrete sampling site by pouring reagent-grade water into prepared sample bottles. These sample bottles were randomly selected from the supply of prepared sample bottles received from Laucks Testing Laboratory. A sample container was selected, filled, and preserved in a manner that was appropriate for each type of analysis for which environmental samples were collected. The field blanks were then analyzed for the same analytes as the environmenta' samples particular to that site. Because field blanks are collected under the same conditions, the results of the field blank analyses were used to indicate the presence of external contaminants (e.g., drill rig or aircraft exhaust, dust particles) that may have been introduced into samples during collection and to make an overall judgement as to whether the contaminants detected in the environmental samples were contributed by conditions independent of the formation sampled or are representative of conditions at SDANG. Field blanks contaminated during transport were assessed by simultaneous evaluation of trip blank

TABLE F-1. ANALYTICAL RESULTS OF FIELD BLANKS, TRIP BLANKS, AND EQUIPMENT BLANKS FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

	Units	Limit of Detection	FB-1	FB-2	FB-2RE	F8-3	TB-1	18-2	TB-3	18-4	18-5	18-6	7-81	18-8	18-9
PETROLEUM HYDROCARBONS	mg/Ł	0.5	£	S	TN	Ş	, N	¥	H	TN	×	X	ž	¥	×
DISSOLVED METALS					X T	ş	Ħ	<u> </u>	×	X	H	Ħ.	H	Ħ	TH
Arsenic	#9/L	ĸ	유	ş											
Lead	#9/L	<b></b> L	29	5.6 5.6											
Selenium	#9/L	n •	<u>5</u> ′	⊋ ⊊											
Dissolved Copper	#9/L	- ~	2	2 2											
Cadmium	7/5# #9/L	ı <del>(-</del>	2	2											
=	#9/L		윤∞	<b>5</b> rv											
			ş		5	S	ş	2	ş	2	2	ş	£	윷	
VOLATILE COMPOUNDS	,,,,,,	٠	Ş	S	Ē	È	5	2	2	<b>}</b>	<u>}</u>	•	<u>!</u>	}	웊
Total Xylenes	#9/L	<b>-</b> -		<b>2 5</b>											웊
Etnylbenzene Wethylene Chloride	#9/L			2(8)											웆
	#9/L			2											윤(
	1/b/	īV		웆							•				<b>*</b>
	1/6#	-		2											운 설
TIC Total	#9/L	:		2											€
SCHINGING STITE COMPA				2		Ş	×	¥	¥	×	¥	×	H	Ħ	×
Schitter it. Schitter	44/L	2	2(8)		1(JB,EH)										
	7/5/ #9/L	14	2		2										
thalene	#g/L	7	웃		2										
Acenaphthene	#9/L	~	29		29										
Dibenzofuran	#9/L	20	2 5		2 2										
rtuorene	1/64	3 0	S		Ş										
Anthracene	1/02	10	2		2										
Fluoranthrene	1/67 #9/L	1 (2)	2		2										
	#9/L	7	Q¥		2										
Denthracene	#9/L	2	9		S										
	μg/L	~	9		2										
Benzo(b)fluoranthene	μg/L	7	2		2!										
Benzo(k)fluoranthene	μg/L	4.	2		2 :										
Benzo(a)pyrene	7/6n	4.	2		⊋ :										
Indeno(1,2,3-c,d)pyrene	#9/L	4 (	€ :		⊋ ⊊										
2,4-Dimethylphenol	#9/L	7	2 9		2 5										
Di-n-butyl puthalate	#9/L	7 (	2 9		5 5										
Di-n-octyl phthalate	#9/r	<b>v</b> c	2 9		2 5										
Ulethyl puthalate	7/64	<b>'</b> ;	3.1		13										

TABLE F-1. ANALYTICAL RESULTS OF FIELD BLANKS, TRIP BLANKS, AND EQUIPMENT BLANKS FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Parameter	Units	Lower Limit of Detection	0A-1B FB	0A-2B EB
PETROLEUM HYDROCARBONS	mg/L	0.5	æ	2
_				
ssolved	#g/L	ľ	오	2
ssolved	#g/L	_	¥QN	*
	#9/L	S	¥	I
ssolved	#g/L	<b></b>	H	눞
ssolved	#9/L	~	¥	Ħ
Dissolved Cadmium	#9/L	<b>-</b> -	K	E
ssolved	#9/L	•-•	<b>;</b>	¥ !
Dissolved 21nc	#8/L	-	Ē	Z
VOLATILE COMPOUNDS				
	49/L	-	Ş	2
Ethylbenzene	#a/L	_	S	2
Methylene Chloride	1/6#	_	운	2
	49/1	-	S	2
Acetone	1/6#	· w	Ş	2
Benzene	1/a/L		S	웆
TIC Total	#9/L	`¦	Z	=
SEMIVOLATILE COMPOUNDS				
Ric(2-ethylhexyl)mhthalate	1/0/	^	٣	2
Naphthalene	1 ~ E	1 4	9	2
2-Methylpaphthalene	1/01	٠.	2	2
Acenaphthene	1/2/	۰ ۲	Ş	2
Dibenzofuran	1707	۸ ا	ş	9
Fluorene	1/b/	ı ~	2	2
Phenanthrene	7/b#	~	Ş	2
Anthracene	1/6#	2	용	웆
Fluoranthrene	#9/L	7	S	욧
Pyrene	#9/L	7	S	웆
Benzo(a)anthracene	#g/L	2	웃	웆
Chrysene	1/6#	2	웆	웆
Benzo(b)fluoranthene	7/5#	4	Š	웆
Benzo(k)fluoranthene	#4/L	4	2	2
Benzo(a)pyrene	#g/L	4	Q.	S
Indeno(1,2,3-c,d)pyrene	44/L	4	ş	2
2.4-Dimethylphenol	1/67	7	웃	2
Di-n-butyl phthalate	#4/L	7	2	~
Di-n-octyl phthalate	1/b#	8	Q	£
Diethyl phthalate	1/b#	7	2	2

results. The results of the field blanks are presented in Table F-1. Analytical results providing information about contamination from sampling techniques at SDANG are briefly discussed in the remainder of this subsection.

- Two field blanks (FB-2 and FB-3) associated with groundwater sampling were analyzed for trace metals. Analytical methods and results are as follows:
  - Lead was analyzed by EPA Method SW 7421 (graphite furnace atomic absorption [GFAA]). Lead was detected in one field blank, FB-2 (2.6 μg/L), associated with Site 3 Base Fire Training Area monitoring wells.
  - Zinc was analyzed by EPA Method 6010 (inductively coupled argon plasma [ICAP]). This element was detected in one field blank, FB-2 (5 μg/L), associated with Site 3 Base Fire Training Area monitoring wells.
- One field blank (FB-1) was prepared and analyzed with soil samples collected at SDANG.
  - Copper and zinc were detected in concentrations (copper at 2 µg/L and zinc at 8 µg/L) less than five times that detected in the associated environmental samples. Therefore, the concentrations of these elements detected in the associated environmental samples are considered to be representative of the environmental condition.
  - Bis(2-ethylhexyl)phthalate was detected in FB-1; however, this compound was also detected in the associated laboratory method blank (15928-BO425MSVWLM with a concentration of 1  $\mu$ g/L). Therefore, the bis(2-ethylhexyl)phthalate detected in this field blank (2  $\mu$ g/L) is considered to have been introduced in the laboratory. Hence, field practices have not significantly introduced bis(2-ethylhexyl)phthalate into the environmental samples.
- The concentrations detected in the soil samples are reported uncorrected for the following reasons:
  - Since trace metals are relatively nonvolatile and the water used in field blank preparation does not come in contact with the sampling apparatus, the concentrations detected (mentioned previously) were contributed solely by the water. Therefore, it is unlikely that the contamination detected in the field blanks is the origin of that detected in groundwater samples.
  - These field blanks were also analyzed for purgeable organic compounds, total petroleum hydrocarbons, and total organic carbon compounds. None of these were detected in any groundwater sampling field blanks.

#### F.2.1.3 Equipment Blanks

Equipment blanks (bailer washes) were prepared for manual and small automated sampling equipment used to collect environmental samples (i.e., equipment blanks were not prepared for drill rig sampling equipment). Equipment blanks were collected during the sampling day by pouring reagent-grade water into/through/over a clean piece of sampling equipment, such as bailers, split-spoon samples, shovels, and trowels, and then dispensing it into prepared sample bottles. These sample bottles were randomly selected from the supply of prepared sample bottles received from Laucks Testing Laboratory. The results of the analyses of equipment blanks will be used to

assess the efficiency of equipment decontamination procedures in preventing cross-contamination between samples and to judge overall whether the contaminants detected in the environmental samples were contributed by the sampling equipment or are representative of conditions at SDANG. The results of the equipment blank analyses are provided in Table F-2.

- Four equipment blanks (EB-12, EB-13, EB-14, and EB-15), were sent with groundwater samples to Laucks Testing Laboratory for analysis. A summary of the results are presented below:
  - Copper was detected using EPA Method SW 6010. Copper was detected in one equipment blank, EB-13 (3 μg/L), associated with groundwater samples collected from Site 1 Underground Fuel Storage Area and Site 3 Base Fire Training Area. Copper was not detected in the associated trip blanks or field blanks. However, copper is a common metal found in water, and the low level of contamination is likely to be caused by the water used to decontaminate the equipment. Since the water used for decontamination does not come in contact with the sample, the effect of the copper in the equipment blank relative to its impact on related environmental samples should be negligible.
  - Lead was detected using EPA Methods SW 6010 (ICAP) and SW 7421 (GFAA) in two blanks, EB-13 and EB-14, at concentrations of 1.4 and 1.9μg/L, respectively. Since lead was detected in a higher concentration in an associated field blank, the lead contamination in these equipment blanks also may be from the water used in decontamination. Therefore, it is unlikely that the lead contamination detected in the field blanks and equipment blanks is the origin of that detected in the groundwater samples.
  - Zinc was detected, using EPA Method SW 6010 (ICAP) in two equipment blanks EB-13 and EB-14, at concentrations of 14 and 5μg/L, respectively. Zinc was detected in the associated environmental samples with concentrations of 22 to 53 μg/L. In addition, zinc was detected in the associated field blank (FB-2). Since zinc was detected in the water used to prepare the field blank, then this water is also likely to be the source of zinc detected in these equipment blanks. Each bailer is rinsed with hexane immediately following the reagent-grade water rinse; therefore, the zinc detected in the environmental samples is considered to be representative of the groundwater at SDANG.
- Four equipment blanks associated with groundwater sampling (E-12 through EB-15, inclusive), were shipped to Laucks Testing Laboratory for VOC analysis. Methylene chloride was detected in three blanks EB-12, EB-13 and EB-14 each with concentrations of 2 µg/L. This compound also was detected in the associated laboratory method blanks. Xylenes (1  $\mu$ g/L), toluene (2  $\mu$ g/L), and acetone (7 $\mu$ g/L) were detected in one equipment blank, EB-15. Xylenes were not detected in the field blanks or trip blanks. Since xylenes were detected in the equipment blank, however, sampling procedures could be the source of contamination. If xylene concentrations in the equipment blanks were less than five times the associated environmental sample concentrations, then the contamination is considered to be representative of the environmental condition. Xylene contamination in samples GW1-4 and GW1-12 are from sampling procedures or apparatuses; otherwise, the xylene contamination is representative of the environmental condition. Site 1 – Underground Fuel Storage Area monitoring well samples provide high levels of xylene contamination that resulted in equipment that was difficult to completely decontaminate. Toluene was not detected in any groundwater samples, so it was introduced into the equipment blanks by the equipment. Toluene, a common laboratory contaminant, is attributed to environmental conditions in this case. Acetone is normally used in the laboratory to clean glassware and although it sometimes contaminates the environmental samples, it did not in this case. Acetone was found in groundwater samples as a result of

TABLE F-2. ANALYTICAL RESULTS OF EQUIPMENT BLANKS FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Parameter	Units	Lower Limit of Detection	E8-1	E8-3	E8-4	E8-5	EB-6	E8-7	EB-8	EB-9	EB-10	EB-11	EB-12	EB-12 RE	EB-13	EB-13 RE
PETROLEUM HYDROCARBONS	πg/L	0.5	용	2	2	2	S	2	£	S	웆	윷	Ş	¥	웆	Ħ
DISSOLVED METALS Dissolved Arsenic Dissolved Lead Dissolved Ceper Dissolved Copper Dissolved Mickel Dissolved Cadium Dissolved Cadium Dissolved Chromium Dissolved Chromium	7/6# 7/6# 7/6# 7/6# 1/6# 1/6#	N to N to M to to to	2.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1	o.t.	N N N N N N N N N N N N N N N N N N N	86844845	ON T.T. IN THE TENT	SSKINKK	8.5777777	S.T. T.	2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.3 2.3	8588888	22211111	H.	248288824	높 ・・
VOLATILE COMPOUNDS Total Xylenes Ethylbenzene Methylene Chloride Toluene Acetone Benzene TIC Total	7/6# 7/6# 7/6# 7/6# 7/6#		55 ₄₀ 555	8842588	35° 55° 5	5545555	354w550	8848888	35w3583	222222	227222	22°°25	268 268 268 268 268 268 268 268 268 268	TX	2 (8) 2 (8) ND ND ND 43	×
SEMIVOLATILE COMPOUNDS Bis(2-ethylbexyl)phthalate Maphthalene 2-Methylnaphalthene Accemphthene Dibenzofuran Fluorene Anthracene Anthracene Fluoranthrene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(x)fluoranthene Benzo(x)fluoranthene Benzo(x)fluoranthene Benzo(x)fluoranthene Benzo(x)fluoranthene Benzo(x)fluoranthene Di-n-buxyl phthalate Di-n-buxyl phthalate Di-n-octyl phthalate Di-n-octyl phthalate	7/6# 7/6# 7/6# 7/6# 7/6# 7/6# 7/6# 7/6#		28888888888888888888888888888888888888	28 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	128 88888888888888888888888888888888888	<u>6</u> 222222222222222222222222222222222222	299999999999999999	(8688888888888888888888888888888888888	65555555555555555555555555555555555555	8999999999999999999999999999999999999		68 54 54 54 54 54 54 54 54 54 54 54 54 54	E E	38(8, EEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE	<b>2</b>	(C. 6. E. 6.

TABLE F-2. ANALYTICAL RESULTS OF EQUIPMENT BLANKS FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SICUX FALLS, SOUTH DAKOTA (CONTINUED)

BONS mg/L 0.5 ND mg/L 11.9	Parameter	Units	LOWEr Limit of Detection	EB-14	EB-14 RE	E8-15
Arsenic μg/L 5 ND Lead μg/L 1.9 Selenium μg/L 1.9 ND Chodium μg/L 1 ND Chromium μg/L 1 ND Chromium μg/L 1 ND Chromium μg/L 1 ND chromium μg/L 1 ND choride μg/L 1 ND μg/L 2 choride	PETROLEUM HYDROCARBONS	mg/L	0.5	Ş	¥	Š
No.	_				7	
1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9   1.9	•	70%	<b>.</b>	R		2
Lead	•	2	٠.	Ç		S
Selenium #g/L 5 ND Copper #g/L 1 ND Ladium #g/L 1 ND Lag/L 2 Lag/L		#8/L	- 1	<u>.</u>		2 5
Copper #9/L 1 ND Nickel #9/L 1 ND Cadium #9/L 1 ND Chadium #9/L 1 ND Chadium #9/L 1 ND Chadium #9/L 1 ND Chadium #9/L 1 CMPOUNDS #9/L 1 ND #9/L 2		# <i>B</i> /L	Ω.	2		Ē :
Nickel #9/L 2 ND Cadium #9/L 1 ND Cadium #9/L 1 ND Cadium #9/L 1 ND Ene #9/L 2 ND Ene #9/L 2 ND Ene #9/L 2 Ene		#g/L	-	2		Ē
Codium Fig/L 1 ND Chromium Fig/L 1 ND Zinc Fig/L 1 ND Enes Fig/L 1 ND Enes Fig/L 1 ND Enes Fig/L 1 ND Eng/L 2 NI Eng/L 2		1/07	~	윷		¥
Control   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972   1972		1/6/	-	Ş		X
COMPOUNDS  Chloride  Enes  Ene		1 / 0 :		9		7
COMPOUNDS  COMPOUNDS  PayL  Pa		#9/L		ξw		X
μg/L 1 ND μg/L 1 2(8) μg/L 1 2(8) μg/L 1 2(8) μg/L 1 1 17 μg/L 2					5	
Wg/L 1 0(B)  Wg/L 1 2(B)  Wg/L 1 2(B)  Wg/L 5 ND  Wg/L 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	VOLATILE COMPOUNDS	;	•	!	Ē	•
#9/L 1 2(8) #9/L 1 2(8) #9/L 1 2(8) #9/L 5 ND #9/L 17 #9/L 2	Total Xylenes	#g/L	<b>,</b>	2		- :
WDS  WB/L  W	Ethylbenzene	1/6#	_	웊		웊
MDS  WB/L  W	Methylene Chloride	#d/L		2(8)		웆
Halate #9/L 5 ND #9/L 1 ND #9/L 1 1 ND #9/L 2 #9/L	Total care and the	1/01		S		~
#9/L 7 1 ND #9/L 1 1 ND #9/L 17 #9/L 2	lotdene	1 / 1	- u	9		
HDS  HDS  HDS  HBJL  LBJL  LBJ	Acetone	#9/L	n •	2 5		- =
WDS  WBS  WBS  WBS  WBS  WBS  WBS  WBS	Benzene	#9/L	-	₹!		€ ;
thalate #g/L 2 #g/L 4 #g/L 2 #g/L 4 #g/L 2 #	TIC Total	#8/F	;	17		2
thalate #g/L 2 #g/L 4 #g/L 4 #g/L 2 #g/L 2 #g/L 2 #g/L 4 #g/L 2 #				ŀ		
thalate #g/L 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	SEMIVOLATILE COMPOUNDS		,	Ē		•
e #9/L rene #9/L rene #9/L rene #9/L rene #9/L rene #9/L rene #9/L rene #9/L rene #9/L rene #9/L	Bis(2-ethylhexyl)phthalate	7/5#	2		1(JB,EH)	7
e #9/L rene #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L	Naphthalene	#4/L	4		웆	웆
c # # # # # # # # # # # # # # # # # # #	2.Nothylpsphalthone	700	2		2	윤
#9/L #9/L #9/L #9/L #9/L #9/L #9/L racene #9/L ranthene #9/L #9/L #9/L red/pyrene #9/L phenol #9/L thalate #9/L	2-necily triabilate tricine	i -			9	ş
#9/L #9/L #9/L #9/L #9/L #9/L racene #9/L ranthene #9/L ne #9/L phenol #9/L thalate #9/L	Acenaphrnene	1,61	Jr		2	2
#9/L #9/L #9/L #9/L #9/L #9/L racene #9/L ranthene #9/L ranthene #9/L -c,d)pyrene #9/L phenol #9/L hthalatc #9/L	Dibenzoturan	#8/r	2 6		2 9	2 5
#9/L  #9/L  #9/L  #9/L  #9/L  #9/L  racene #9/L  #9/L  #9/L  -c,d)pyrene #9/L  phenol #9/L  hthalate #9/L	Fluorene	#8/F	7 (		€ :	2 :
#9/L #9/L #9/L #9/L #9/L ne #9/L yrene #9/L to #9/L te #9/L	Phenanthrene	#9/L	2		⊋ :	2 :
#9/L #9/L #9/L #9/L ne #9/L yrene #9/L to #9/L to #9/L te #9/L	Anthracene	#g/L	2		2	
#9/L #9/L #9/L ne #9/L yrene #9/L to #9/L te #9/L	Fluoranthrene	1/6#	~		웆	2
#9/L #9/L ne #9/L yrene #9/L to #9/L te #9/L	Pyrene	1/6#	2		2	물
ne #9/L ne #9/L yrene #9/L to #9/L to #9/L te #9/L	Benzo(a)anthracene	1/07	2		웆	2
ne kg/L ne kg/L yrene kg/L tc kg/L te kg/L		1/0	۱۸		£	2
ne #9/L ne #9/L yrene #9/L to #9/L te #9/L	ciii yseile	) ) )	J ~		9	<b>a</b>
ne #9/L yrene #9/L tc #9/L te #9/L te #9/L	Benzo(b) fluoranthene	#9/L	<b>;</b> `		2 9	2 2
#9/L yrene #9/L to #9/L te #9/L	Benzo(k)fluoranthene	#8/L	\$.		€ €	Ē
yrene $\mu g/L$ to $\mu g/L$ te $\mu g/L$ te	Benzo(a)pyrene	#9/L	4		€ :	<b>2</b> 9
μg/L tc μg/L te μg/L	Indeno(1,2,3-c,d)pyrene	μg/L	7		2	
te μg/L te μg/L	2.4-Dimethylphenol	1/6#	7		2	웆
te μ9/L	pi-n-butvi phthalate	1/6#	7		윷	2
	Displacety phthalate	1/01	2		오	2
		1			Ş	[P1
•	Tio Tital	7/6:	J ;		72	, <u>F</u>

sample procedures or equipment, not from the environment. Acetone in environmental samples needs to be 10 times greater than the concentration found in the associated equipment blank. Since acetone was not detected in the environmental samples at concentrations greater than 10 times that detected in the equipment blanks, the acetone detected in the environmental samples was disregarded.

- Four equipment blanks (EB-12 through EB-15, inclusive), were collected and analyzed for semivolatile organic compounds (SVOCs) using EPA Method SW 3510/8270. Bis(2ethylhexyl)phthalate was detected in two equipment blanks EB-12RE and EB-15, at concentrations of 38 µg/L and 2 µg/L, respectively. Bis(2-ethylhexyl)phth:late was detected in the method blank (15928-BO512MSVWLK with a concentration of 1 µg/L) associated with EB-12RE. Since the concentration of this compound detected in EB-12RE is greater than ten times the concentration detected in the method blank, bis(2-ethylhexyl)phthalate is considered to have originated from incomplete equipment decontamination or the reagentgrade water used to prepare this equipment blank. However, the contamination in Site 3 – Base Fire Training Area monitoring wells, July groundwater sampling, and wells MW-1-13 and MW-1-14 all had levels of contamination similar (3-47 µg/L) to those in the blanks. Since contamination levels in the blanks are greater than the contamination levels in the environmental samples, the contamination is likely from the equipment rinsate water. Diethylphthalate was detected in EB-15 at a concentration of 3  $\mu$ g/L. Since this is a low-level contaminant and it was measured at concentrations in the environmental samples greater than 10 times that of the equipment blank, the contamination from sampling procedures or apparatus did not contribute significantly to that of the groundwater.
- Ten equipment blanks associated with soil sampling (EB-1, EB-3 through EB-11 inclusive), were analyzed for trace metals. The following is a brief discussion of the analytical results that provide information concerning equipment cross-contamination during soil sampling at SDANG.
  - Although ten equipment blanks accompanied soil samples sent to Laucks Testing Laboratory for analysis, only three (EB-4, EB-5, and EB-11) were analyzed for copper. Copper was detected in two equipment blanks, EB-4 and EB-5 at concentrations of 3 and 4 μg/L, respectively. This element was detected in the soil samples associated equipment blanks EB-4 and EB-5 with concentrations (9 to 22 mg/Kg) significantly greater than that of the blank. It can be concluded that contamination resulting from sampling procedures or apparatus may not have contributed significantly to the environmental samples collected from Site 3 Base Fire Training Area soil borings and Site 1 Underground Fuel Storage Area drilling of monitoring wells and soil borings.
  - Three equipment blanks (EB-4, EB-5, and EB-11) were analyzed for chromium. This element was detected in two blanks, EB-4 and EB-5 at 2 and 4 μg/L, respectively. It can be concluded that chromium was not significantly introduced as a result of sampling procedures or from sampling apparatus, because the concentration in the equipment blanks were less than five times that of the concentration of the chromium in related environmental samples (12 to 29 mg/Kg), those of Site 3 Base Fire Training Area soil borings and Site 1 Underground Fuel Storage Area drilling of monitoring wells and soil borings.
  - All ten equipment blanks were analyzed for lead by EPA Method SW 7421, using GFAA. Lead was detected in eight blanks from 1.0 to 2.5 μg/L. In several samples, B3-1-5, B3-2-5, B3-2-2.5, B3-4-0, B3-4-5, B3-5-0 and B3-5-2.5, the data (lead concentrations in environmental samples range from 2.0 to 15.1 mg/Kg) indicate that the contamination comes from present soil conditions rather than being introduced from outside sources, as previously discussed with copper and chromium.

- Nickel was analyzed in three equipment blanks (EB-4, EB-5, and EB-11) and detected in only one, EB-5 at a concentration of 4 μg/L. For the same reasons as these it can be concluded for copper, chromium, and lead that sampling procedures or sampling apparatuses did not contribute significantly to the nickel (17 to 31 mg/Kg) detected in the soil samples.
- Zinc was detected in three blanks EB-4, EB-5, and EB-11 at concentrations of 9, 12, and 16 μg/L, respectively. Zinc contamination in environmental samples ranged in concentration from 46 to 110 μg/L. Since the zinc reported in the environmental samples is much greater than in the concentrations in the blank, the zinc contributed from the sampling effort is minimal.
- Since equipment blank results are reported in parts per billion and soil results are reported in parts per million (a difference of three orders of magnitude), it is unlikely that the equipment decontamination procedures impacted the analytical results.

#### F.2.1.4 Field Replicates

Field replicates were collected at the same time and using the same techniques as the planned environmental samples. Replicate locations were either preselected prior to the daily sampling activities or selected based on an abnormal instrument reading or an unforeseen field condition (e.g., floating product or strong fuel odor). The identification of each replicate was coded to prevent external laboratory bias.

Replicate water samples were collected with a Teflon® bailer. For the purposes of the project, water samples were designated as replicates even though several bailer volumes were needed to fill the sample containers, depending on the number required at any one location. The volatile fraction was collected first to minimize compound volatilization. The first bailer volumes were used to fill the VOC vials of the environmental samples. Subsequent volumes were used to fill the replicate VOC vials. Sample volumes for the remaining analyses were collected after the last VOC vial was filled.

Replicate soil samples were collected with a 2-inch diameter split-spoon sampler. The sample portion to be analyzed for VOCs was collected first to minimize sample volatilization. The soil core was split lengthwise using a Teflon® spatula, and the environmental sample was collected by transferring a portion of the soil to the sample container. The replicate was collected immediately after, using the same technique. After the volatile portion was collected, the remaining soil was mixed on a Teflon® board and subdivided between the remaining sample containers. This mixing was used only for the samples to be analyzed for inorganic (i.e., metals) and semivolatile organic (e.g., extractables, organochlorine pesticides) parameters.

The results of the field replicate analyses were used to assess the precision of the field sampling methods and to make an overall judgement as to whether the contaminants detected in the environmental samples are representative of conditions at SDANG. The results of the field replicate analyses are presented in Tables F-3 and F-4. A summary of the field replicate results is provided below:

- Field replicates were collected in quantities equal to 11 percent of the total number of environmental samples. Five field replicates were taken during the groundwater sampling at SDANG. The control limits for water samples are established as 20 percent-cases where relative percent differences (RPDs) between the sample and its duplicate exceed control limits are discussed below:
  - Many of the analytes of the field-replicated samples that were analyzed were not detected (92 to 100 percent of the analytes in the applicable samples). Of the detected analytes, only as many as 8 percent were outside the arbitrarily established control limit of 20 percent RPD. Another criteria, an established Contract Laboratory Protocol (CLP), for the detected analytes should be considered: those detected at levels greater than five times the minimum detection limit. Of the analytes detected with RPDs greater than 20 percent and with a concentration greater than five times the minimum detection limit, only four analytes in two samples were outside of the previously established control limits for field precision in groundwater sampling. The RPD control limits for xylene were exceeded in samples MW-1-4 (81 percent) and MW-1-12 (117 percent). The RPD control limit for total petroleum hydrocarbon (TPH) was exceeded in sample MW-1-14 (35.7 percent). The RPD control limit for ethylbenzene was exceeded in MW-1-12 (137 percent).
  - No corrective actions were taken because groundwater sampling precision was considered in control. Sample heterogeneity may account for the case where TPH was above the control limit. Sample volatilization may account for the RPDs of the xylenes and ethylbenzene that were considered outside the control limits.
  - Soil field replicates were collected in quantities equal to 13 percent of the total number of environmental samples. Five field replicates were taken during soil sampling at SDANG. Precision in field sampling was determined by RPDs of field replicates. A summary of the out-of-control (greater than thirty percent RPD) cases is presented below:
    - -- Many of the analytes in the soil-replicated samples were undetected after analysis (88 to 96 percent of the targeted analytes were undetected). Considering only the detected values, less than 3 percent of the RPD values were above the established control limits of 30-percent RPD maximum. An analyte detected with a concentration five times greater than the minimum detection limit and a RPD greater than 30 percent is considered outside the control limits. Ethylbenzene and xylenes were above the previously established control limits (B3-3-0 with RPDs of 44.8 and 104, respectively). Arsenic was also outside the established control limits (MW-1-6-15 with a 37.3 RPD). TPH was outside the control limits in sample MW-1-12-15 with a RPD of 44.8.
    - -- No corrective actions were taken because soil sampling precision was considered in control. For the cases where TPH and arsenic were out-of-control, sample heterogeneity may account for this situation. Mixing of the soil in the field proves to be difficult in the cases of metals and TPH. Sample volatilizational, though preventative measures are taken, could still be a problem in the cases of ethylbenzene and xylene.

TABLE F-3. RESULTS OF REPLICATED SOIL SAMPLE ANALYSES FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Parameters	Units Lim	Limit of	<b>B3-2-0</b>	83-2-0	B3-3-0	83-3-0
Associated Field QC Samples		5	EB-4 TB-3 FB-1	18-3 18-3	18-3 18-3 18-1	18-3 18-3 18-1
PETROLEUM HYDROCARBONS	mg/Kg DB	8	59(H)	(н)96	34(H,MR)	130(H)
TOTAL ORGANIC CARBON	₩ DB	0.1	Z	TN	TN	IN
METALS		(	•	e I	``	ì
Lead			æţ	æ. c	7.9	·:
Selection	mg/kg DB	0.0	<u> </u>	7 P	. S	2
Copper		-	9	2	٥	=
Beryllium		0.1	7.0	4.0	. 0°3	0.0
Nickel		<i>ا</i> د	2	2	<b>23</b> (	2
Cadmium		ָרָי בי	<b>⊋</b> ५	3 t	<b>2 £</b>	2 4
Chromium Zinc	mg/kg DB	-,-	. 83 	78	29	64
	1					
VOLATILE COMPOUNDS	200	•	•	<b>S</b>	ş	ŝ
Acetone	#9/kg 05	V 00			2 5	<b>2</b>
Toluene	ug/Kg DB	0			2 2	2
Ethylbenzene	44/Kg DB	1 ~			2700	17000
Total Xylenes	µg/Kg DB	~	2		2400	17000
TIC Total	μg/Kg DB	;			180000	390000
SEMIVOLATILE COMPOUNDS						
Naphthalene		22	웊	ş	390(H, J)	750(H,J)
2-Methylnaphthalene		38	2	2	2	180(H, J)
Acenaphthene		38	운 :	2	오 :	<b>2</b>
Dibenzofuran		88	⊋ 9	€ 9	<b>2</b> :	2
F{Uorene Dbassatbassa	#9/Kg U8	0 8	⊋ ⊊	⊋ ⊊	2 5	<b>3</b> 5
Anthracene		2 6	2 5	2 5	2 5	2 5
Di-n-butyl phthalate		38	2	2	9	2
Fluoranthene		38	웊	2	£	2
Pyrene		38	웆	25(J,H)	9	오
Benzo(a)anthracene		33	2	2	Q	웊
Chrysene	μg/Kg DB	86	<b>2</b> ;		2	2
Bis(2-ethylhexyl)phthalate	µg/Kg 08	ž,	85(B)	100(B, H)	2	2
Benzo(b) t luoranthene	49/Kg DB	49	<b>2</b> 9	51(H, JX)	2 9	2 9
Benzo(K)Ttuorantnene	#9/K9 DB	2 %	2 5	(12,17)	29	2 5
benzo(a)pyrene	00 64/6#	2 %	2 5	2 5	2 5	5 5
Diberzo(a h)anthracene	Ma/Kg DR	2 %	2 5	2 5	2 5	2 5
Renzola h ilnerylene	IIG/KG DR	22	2	) <u>S</u>	9	£ £
Diethy phthalate	ug/Kg DB	88	2	2	2	2
Dimethyl phthalate		8	2	2	2	2
4-Methylphenol	49/Kg DB	38	92	£	2	Q
Phenol	49/Kg DB	38	웊	49	Q	2
Di-n-octyl phthalate		38	12(1)	ş	2	呈
•						

TABLE F-3. RESULTS OF REPLICATED SOIL SAMPLE ANALYSES FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Parameters	Units Limi	Limit of MW	MV1-6-15 MV1-6-15	41-6-15 pur	MV1-10-15 MV1-10-15	#41-10-15 and	MV1-12-15	21-21-1MH
Associated Field QC Samples		5	EB-6 18-3 FB-1	EB-6 18-3 FB-1	EB-9 18-4 FB-2	18-4 18-2 18-2	EB-10 TB-5 FB-2	EB-10 TB-5 FB-2
PETROLEUM HYDROCARBONS	mg/Kg DB	20	Ş	æ	QN	웊	730(H)	(H)0/2
TOTAL ORGANIC CARBON	% DB	0.1	¥	TX	K	×	FX	K
METALS								
Lead		0 7	8. °	M1	m c	o.c	2.6	
Arsenic Sefecien		0.0	, t	) . K	7*7 IN	7 - Z	N. M.	3 <del>-</del>
Copper		-	Ż	¥	Z	N.	<b>X</b>	
Beryllium Birth		٠.	55		3E 3		#	
Cadmicm		.5	ž	Z		×	E	Ē
Chromium Zinc	mg/Kg DB mg/Kg DB		55	2 2	Z Z	보	TN TN	<b>Z Z</b>
	i							
VOLATILE COMPOUNDS Methylene Chloride		~	60	м	9	9	QX.	2
Acetone		<b>∞</b>	7.	61	8	2	<b>9</b>	Z
Toluene		~ (	오 9	2	29	오	29	<b>2</b> 9
Ethylbenzene Total Xvlenes	49/Kg UB	v ~	2 2	2 2	2 2	2 2	2	<b>.</b> 2
Tic Total		;	2	£	Q	S	42000	24000
SEMIVOLATILE COMPOUNDS		i	!	:	!	!		
Naphthalene D-Mothylpowhthologo		0 ¤	2 9	2 5	2 5	<b>3</b> 5	300	55
2-metrity triagations one Acepaph thene		88	£ £	2 2	2	£ £	2	2
Dibenzofuran		38	2	2	9	2	(L)71	₽:
Fluorene Dhenanthrene	#g/Kg DB	8 K	2 9	<del>2</del>	2 5	2 5	<b>3</b> €	<b>2</b> 5
Anthracene		88	2	Ş	2	2	2	2
Di-n-butyl phthalate		38	오 :	<b>2</b> !	오 :	2	15(J)	2
Figoranthene		20 8 20 8 20 8 20 8 20 8 20 8 20 8 20 8	2 9	29	25	2 5	2 5	<b>2 2</b>
Pyrene Renzo(a)anthracene		2 82	2 2	2 2	2	2 2	2	2
Chrysene		38	2	Q.	2		2	
Bis(2-ethylhexyl)phthalate		88 %	26(B)	50(8)	34(J,H,CC)	40(H,CC)	24(1,00)	22(1,00)
Benzo(b)fluoranthene Benzo(k)fluoranthene		98	<u> </u>	2 5	2 5	2 5		2 5
enzo(a)pyrene		2	2	웆	2	웆	2	2
Indeno(1,2,3-c,d)pyrene		<b>2</b> ;	웆	2	2	2	Q	물
ibenzo(a,h)anthracene		27	2 9	2 9	2 9	29	2 9	2 :
Benzo(g,h,i)perylene Diothyl akthalate		0 g	<b>3</b>	2 5	2 5	2 5	2 5	2 5
Dietilyt Miliatate Dimethyl phthalate		88	2 2	2 9	2.9	2	2	14(1)
4-Methylphenol		38	2	2	2	2	S	2
Phenot	49/Kg DB	38	29	2 9		2 9	<b>2</b> 9	29
1-n-octyl putnatate		ð	Ž	2	2	₽	2	

TABLE F-4. RESULTS OF REPLICATED GROUNDWATER SAMPLE ANALYSES FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Parameter	Lower Units Limit of	Lower imit of	MW1-4	MW1-4	MU1-4	GW1-4	6W1-4	GW1-10	GW1-10
Associated Field QC Samples		netection	EB-12 TB-7 FB-2	EB-12 TB-7 FB-2	EB-12 18-7 18-2	EB-15 TB-9 FB-3	EB-15 18-9 FB-3	EB-15 TB-9 FB-3	EB-15 TB-9 FB-3
PETROLEUM HYDROCARBONS	mg/L	0.5	3.3(H)	2.3(H)	, F	1.3	2.2	QN	웆
	7/6# 7/6# 7/6# 7/6# 7/6# 7/6#	<b>ν⊷ν</b> ⊷ν←←	3.5	8.2. 8.2. IN P.	Ē	S.ZZZZZZ	0.8.0 (J.)8.0 (L)8.1 (L)8.1 IN TN	222222	9922555
Ulssolved Linc VOLATILE COMPOUNDS Total Xylenes Ethylbenzene Mcthylene Chloride Toluene Acetone Bunzene	7/6# #8/ #8/ #8/ #8/ #8/ #8/ #8/		6388888 83888888	#888888 <del>*</del>	¥		2(EB) ND ND ND ND ND ND ND (EB, TB)	<b>2 9</b>	222252
SEMIVOLATILE COMPOUNDS Bis 62-ethylhexyl)phthalate Naphthalene 2-Methylnaphthalene Acenaphthene Dibenzofuran Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Cirysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(x)fluoranthene		ท4ทนทนทนทนทน444ทนท _ี !	200 200 200 200 200 200 200 200 200 200	: <b>1</b>	17(8,EH) 14(EH) 16(EH) 1(J,EH) 2(EH) 3(EH) 3(EH) 3(EH) 5(EH) 80 80 80 80 80 80 80 80 80 80 80 80 80	######################################	<b>48205628888888888888888888888888888888888</b>	₽	~ 555555555555555555555555555555555555

TABLE F-4. RESULTS OF REPLICATED GROUNDWATER SAMPLE ANALYSES FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Parameter	Units		MW1-12	MW1-12	MW1-12	MW1-12	MU3-2	MW3-2	M43-2	MW3-2
Associated Field QC Sampl	sə	Detection	EB-12 TB-7 FB-2	EB-12 TB-7 FB-2	EB-12 18-7 FB-2	EB-12 18-7 FB-2	EB-13 TB-8 FB-2	EB-13 TB-8 FB-2	EB-13 TB-8 FB-2	EB-13 TB-8 FB-2
PETROLEUM HYDROCARBONS	mg/L	0.5	2.2(H)	IN	2.0	TN	QN	N	Q.	N
Dissolved Arsenic Dissolved Arsenic Dissolved Lead Dissolved Selenium Dissolved Copper Dissolved Copmer Dissolved Cadmium Dissolved Chromium Dissolved Zinc	1/6# 1/6# 1/6# 1/6# 1/6# 1/6#	N ~ N ~ N ~ ~ ~	2.12 THYNTHY	Į.	2.2 MH MH M	Į,	ND 5.2(F8) ND 15 15 16 ND ND 3	×	ND 4.0(FB) ND 5 14 14 3 22(EB,FB)	Z
VOLATILE COMPOUNDS Total Xylenes Ethylbenzene Methylene Chloride Toluene Acetone Benzene	\6# \\6# \\6# \\6# \\6#		840(CC) 170 ND ND ND ND ND ND	1100(0,CC) 160(0) ND ND ND ND ND ND ND	220(CC) 32 ND ND ND ND ND	TX	<b>222220</b>	Ħ	9	¥
SEMIVOLATILE COMPOUNDS Bis.(2-ethylhexyl)phthalat Naphthalene 2-Methylnaphthalene Acenaphthene Dibenzofuran Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(a)pyrene Indeno(1,2,3-c,d)pyrene 2,4-Dimethylphenol Di-n-butyl phthalate Di-n-octyl phthalate Diethyl phthalate	te #9/L #9/L #9/L #9/L #9/L #9/L #9/L #9/L	. NAUNUNUNUNA444UNUN	8888 66 66 66 66 66 66 66 66 66 66 66 66	±	<b>½</b>	19(8,EH) 72(EH) 46(EH) 1(J,EH) 1(J,EH) ND	~9222222222222222222222222222222222222	3(8,EH) NO N	~ <u> </u>	2(8,EH) ND

#### F.2.2 Laboratory Analysis for Soil

#### F.2.2.1 Summary of Procedures and Equipment

The following is a list of the procedures used to analyze the soil samples collected at Base. Table F-5 and F-6 list the analytical methods, detection limits, and the total number of soil samples collected during the RI.

- Trace Metals All soil samples were analyzed for priority pollutant metals using the EPA document, Test Methods For Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Third Edition. Antimony (SW3005/7041), arsenic (SW3050/7061), lead (SW3050/7421), selenium (SW3050/7741), and thallium (SW3050/7841) were analyzed using GFAA; mercury (SW7471) was analyzed by cold vapor generation; and the remainder of the metals (i.e., beryllium, copper, cadmium, chromium, nickel, silver, and zinc) were analyzed by ICAP spectroscopy (SW3050/6010).
- Volatile Organic Compounds All soil samples were analyzed for VOCs using EPA Method 8240, described in SW-846, Third Edition. Using this method, a 5-gram sample is purged directly in a specially designed sparger and then analyzed using gas chromatography/mass spectrometry (GC/MS). Surrogate and internal standard compounds are added to the sample immediately before purging. Compounds are identified by comparing the ion chromatograms of the suspected analytes with the ion chromatograms of 8240 target compounds contained in the mass spectrometer data system.
- Semivolatile Organic Compounds All soil samples were analyzed for SVOCs using EPA Method 8270, described in SW-846, Third Edition. Using this method, a 30-gram soil sample is extracted with methylene chloride and acetone by sonication. Radiolabeled surrogate compounds are added to the sample before extraction. After the extraction is completed, the solvent is concentrated to a final volume of 1.0 milliliter (mL). Compounds used for quantitation of target compounds (i.e., internal standards) are added to the sample extract before instrumental analysis. Target compounds are identified in the same manner as described for VOCs.
- Total Petroleum Hydrocarbons and Total Organic Carbon All soil samples to be evaluated for TPH were extracted using Method SW3550 and analyzed using Method E418.1. All soil samples were analyzed for total organic carbon (TOC) using an internal laboratory method adapted from the guidelines in Recommended Protocols for Measuring Conventional Sediment Variables in Puget Sound, August 1986.

#### F.2.2.2 Level C Data Validation and Quality Assurance Review Results

This subsection summarizes significant findings of the Level C QA review of the data resulting from the analysis of the soil samples collected at SDANG. This summary discusses the following analytical criteria where applicable: holding time requirements, calibration, method-required blanks (e.g., preparation blanks, reagent blanks), surrogate and matrix spike/matrix spike duplicate (MS/MSD) recoveries, instrument tuning, and results of laboratory control sample (LCS) analyses. Required holding times and container types and preservatives for each analyte are given in Table F-7.

TABLE F-5. ANALYTICAL METHODS, DETECTION LIMITS, AND TOTAL NUMBER OF SOIL SAMPLES AT SOUTH DAKOTA ATR MATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA

Parameter	Analytical Method	Analytical Detection Method Limit	Reporting Units	Number of Analyses	Trip Blanks	Field Blanks	Equipment Blanks	Replicates	Total Analyses
Petroleum Hydrocarbons	SW 3550/ E 418.1	50	mg/Kg	45	¥	-	10	۰	29
Priority Pollutant Metals Screen	SW 3050/ 6010	*	mg/Kg	21	¥	-	m	m	88
Arsenic	70507 7060	0.5	mg/Kg	45	¥	-	10	9	95
Antimony	SW 3005/ 7041	2.5	mg/Kg	21	¥	-	m	ю	28
Lead	SW 3050/ 7421	0.5	mg/Kg	57	¥	-	10	9	95
Mercury	SW 7471	0.1	mg/Kg	21	NA A		m	м	82
Selenium	SW 3050/ 7740	0.5	mg/Kg	21	NA NA	-	w.	m	28
Thallium	SW 3050/ 7841	0.5	mg/Kg	21	X	-	m	ю	28
Volatile Organic Compounds (VOCs)	SN 8240	*	µ9/К9	45	9	-	10	<b>v</b> 0	88
Semivolatile Organic Compounds (SVDCs)	SN 3550/ 8270	*	ид/Ка	45	N	-	· 10	9	<b>29</b>

TABLE F-6. CRDLs FOR SOIL SAMPLES AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA

Parameter	CRDL	Units	Parameter	CRDL	Units
INORGANICS					
Antimony	2.5	mg/Kg DB	4-Chloro-3-methylphenol	67	μg/Kg DB
Arsenic	0.5	mg/Kg DB	2-Chloronapthalene	33	μg/Kg DB
Beryllium	0.1	mg/Kg DB	2-Chlorophenol	33	μg/Kg DB
Cadmium Chromium	0.5	mg/Kg DB	4-Chlorophenyl-phenylether	33	μg/Kg DB
Copper	1	mg/Kg DB	Chrysene	33	μg/Kg DB
Lead	0.5	mg/Kg DB mg/Kg DB	Dibenzofuran	33	μg/Kg DB
Mercury	0.1	mg/Kg DB	Dibenzo(a,h)anthracene 1,2-Dichlorobenzene	67 33	μg/Kg DB
Nickel	2	mg/Kg DB	1,3-Dichlorobenzene	33	μg/Kg DB
Selenium	0.5	mg/Kg DB	1,4-Dichlorobenzene	33	μg/Kg DB μg/Kg DB
Silver	0.6	mg/Kg DB	3,3'-Dichlorobenzidine	330	μg/Kg DB
Thallium	0.5	mg/Kg DB	2,4-Dichorophenol	67	μg/Kg DB
Zinc	1	mg/Kg DB	Diethyl phthalate	33	μg/Kg DB
			2,4-Dimethylphenol	33	μg/Kg DB
TPH OIL & GREASE	20	mg/Kg DB	Dimethyl phthalate	33	μg/Kg DB
		· ·	Di-n-butyl phthalate	33	μg/Kg DB
TOTAL ORGANIC CARBON	0.1	% DB	4,6-Dinitro-2-Methylphenol	330	
			2,4-Dinitrophenol	330	μg/Kg DB
VOLATILE ORGANICS (BY GC/MS	S)		2,4-Dinitrotoluene	67	μg/Kg DB
Acetone	10	μg/Kg DB	2,6-Dinitrotoluene	67	μg/Kg DB
Benzene	2	μg/Kg DB	Di-n-octyl phthalate	33	μg/Kg DB
Bromodichloromethane	2	μg/Kg DB	Flouranthene	33	μg/Kg DB
Bromoform	2	μg/Kg DB	Flourene	33	μg/Kg DB
Bromomethane	2	μg/Kg DB	Hexach Lorobenzene	67	μg/Kg DB
2-Butanone	6	μg/Kg DB	Hexachlorobutadiene	33	μg/Kg DB
Carbon Disulfide	2	μg/Kg DB	Hexachlorocyclopentadiene	67	μg/Kg DB
Carbon Tetrachloride	2	μg/Kg DB	Hexachloroethane	67	μg/Kg DB
Chlorobenzene	6	μg/Kg DB	Indeno(1,2,3-cd)pyrene	67	μg/Kg DB
Chloroethane	6	μg/Kg DB	Isophorone	33	μg/Kg DB
Chloroform	2	μg/Kg DB	2-Methylnapthalene	33	μg/Kg DB
Chloromethane	2	μg/Kg DB	2-Methylphenol	33	μg/Kg DB
cis-1,3-Dichloropropene	6	μg/Kg DB	4-Methylphenol	33	μg/Kg DB
Dibromochloromethane 1,1-Dichloroethene	6	μg/Kg DB	Napthalene ·	67	μg/Kg DB
1,1-Dichloroethane	2	μg/Kg DB	2-Nitroaniline	67	μg/Kg DB
1,2-Dichloroethane	2	μg/Kg DB	3-Nitroaniline	170	μg/Kg DB
1,2-Dichloroethene (total)	2	μg/Kg DB μg/Kg DB	4-Nitroaniline Nitrobenzene	67	μg/Kg DB
1,2-Dichloropropane	2	μg/Kg DB	2-Nitrophenol	33 67	μg/Kg DB
Ethylbenzene	2	μg/Kg DB	4-Nitrophenol	330	μg/Kg DB
2-Hexanone	6	μg/Kg DB	N-Nitrosodiphenylamine(1)	33	μg/Kg DB
Methylene Chloride	ž	μg/Kg DB	N-Nitroso-di-n-propylamine	33	μg/Kg DB
4-Methyl-2-Pentanone	6	μg/Kg DB	Pentachlorophenol	330	μg/Kg DB μg/Kg DB
Styrene	ž	μg/Kg DB	Phenanthrene	33	μg/Kg DB
1,1,2,2-Tetrachloroethane	6	μg/Kg DB	Phenol	33	μg/Kg DB
Tetrachloroethene	2	μg/Kg DB	Pyrene	33	μg/Kg DB
Toluene	Ž	μg/Kg DB	1,2,4-Trichlorobenzene	33	μg/Kg DB
Total Xylenes	2	μg/Kg DB	2,4,5-Trichlorophenol	67	μg/Kg DB
trans-1,3-Dichloropropene	6	μg/Kg DB	2,4,6-Trichlorophenol	67	μg/Kg DB
Trichloroethene	2	μg/Kg DB	-, , , a	٥.	שם פא (פת
1,1,1-Trichloroethane	2	μg/Kg DB	(1) Cannot be separated from	n Diphe	envlamine
1,1,2-Trichloroethane	2	μg/Kg DB			,
Vinyl Acetate	2	μg/Kg DB			
Vinyl Chloride	2	μg/Kg DB			
SEMI-VOLATILES (BY GC/MS)					
Acenaphthene	33	μg/Kg DB			
Acenaphthylene	33	μg/Kg DB			
Anthracene	33	μg/Kg DB			
Benzoic Acid	830	μg/Kg DB			
Benzo(a)anthracene	33	μg/Kg DB			
Benzo(a)pyrene	67	μg/Kg DB			
Benzo(b)flouranthene	67 47	μg/Kg DB			
Benzo(g,h,i)perylene	67 47	μg/Kg DB			
Benzo(k)flouranthene	67 77	μg/Kg DB			
Benzyl alcohol	33	μg/Kg DB			
Bis(2-chloroethoxy)methane	33	μg/Kg DB			
Bis(2-chloroethyl)ether	33	μg/Kg DB			
Bis(2-chloroisopropyl)ether		μg/Kg DB			
Bis(2-ethylhexyl)phthalate	33	μg/Kg DB			
4-Bromophenyl-phenylether	67 77	μg/Kg DB			
Butylbenzyl phthalate	33	μg/Kg DB			
4-Chloroaniline	33	μg/Kg DB			

TABLE F-7. SAMPLE CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES OF SOIL SAMPLES ACCORDING TO MEASUREMENT AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Measurement	Container Type	Preservative	Holding Time
ORGANICS Purgeable Organics Extractable Organics Total Petroleum Hydrocarbons	8 oz. widemouth glass jar* 16 oz. widemouth glass jar* 8 oz. widemouth glass jar*	, , , , , , ,	14 days 14 days extraction, 40 days analysis 14 days
INORGANICS Total Metals Arsenic, Lead, Selenium Mercury	16 oz. widemouth glass jar* 16 oz. widemouth glass jar* 16 oz. widemouth glass jar*	444 000	6 months 6 months 30 days
MISCELLANEOUS INORGANICS Total Organic Carbon	One 1.0L plastic bottle	H2SO4 to pH <2	2 28 days

*Teflon®-lined black phenolic screw-top cap

- Trace Metals A summary of the quality control checks for metals in soils, which were performed by the analytical laboratory, is provided in Table F-8. All soil samples were analyzed within the contract-required holding times for trace metals (6 months) and mercury (28 days for water samples). All percent recoveries calculated from the initial and continuing calibration verification (ICV and CCV, respectively) analyses were within the contract-required control limits for trace metals (90 to 110 percent) and mercury (80 to 120 percent), except for selenium (84 percent for both ICV and CCV analyses). The percent recovery for this element in a third CCV analysis was 91. All other QC checks for selenium were within control, including the LCS and MS/MSD analyses; therefore, quantitation of this priority pollutant metal is not considered to have been significantly affected by the initial and continuing calibration results. No interferents were detected in any methodrequired blank analyses. One ICAP interference check sample (ICS) analysis was conducted. All percent recoveries were within the control limits (80 to 120 percent) for the initial analysis. All percent recoveries were within the control limits for the final analysis except for silver (123 percent). Since the recovery of this element is only slightly outside the control limit, this result is not considered to have significantly affected the quantitation of silver detected in any samples. All percent recoveries and RPDs calculated from the four MS/MSD analyses conducted were within the contract-required control limits except the following: the RPD for selenium in B3-5-2.5 was 24 percent (14 percent); the percent recovery for lead in BK3-20 was 138 percent (131 percent); the recoveries of beryllium was greater than the upper control limit (104 percent) in soil samples MW-1-6-20 (121 and 120 percent) and BK3-20 (119 and 117 percent); and the recovery of cadmium (126 percent) was greater than the upper control limit (124 percent) in MW-1-6-20. In the soil samples where selenium, lead, beryllium, and cadmium were not detected, the QC results are not considered to have a significant impact since the percent recovery or RPD values for these elements are greater than the applicable upper control limits. In the soil samples where selenium, lead, and beryllium were detected, the percent recovery results indicate that the concentrations reported may be higher than actually existence in the environment. Since the percent recoveries reported were only slightly greater than the upper control limit, however, these results were considered to have little impact on the sample concentrations reported. Three LCS analyses were conducted. The percent recovery of chromium (69.8 percent) was less than the lower control limit (79.5 percent) set by the EPA for solid samples. All other percent recoveries were within the control limits. One ICS (initial and final) and one GFAA contract-required detection limit (CRDL) verification standard were analyzed. Although the EPA has not established control limits for this QC check analysis, any positive recovery greater than zero is considered acceptable. The lowest percent recovery reported from the CRDL analyses is 74 percent for nickel.
- Volatile Organic Compounds Summaries of the quality control checks for volatile organic compounds in soil samples are given in Tables F-9 and F-10. All soil samples were analyzed within the contract-required holding time (14 days). All initial and continuing calibration and tuning and mass calibration criteria were met for each GC/MS unit used. No target analytes were detected in the method blanks analyzed before the analysis of the soil samples. All surrogate recoveries were within the contract-required control limits (81 to 117 percent) except that of dg-toluene (57 percent) in BK-2-20. The recovery (58 percent) of this surrogate was less than the lower control limit in the BK-2-20 reanalysis, thereby documenting matrix interference as required by the EPA CLP. All percent recoveries and RPD values calculated from the MS/MSD analyses of four soil samples (BK2-25, MW-1-7-20, B3-2-0, and MW-1-10) were within the control limits set for laboratory accuracy and precision.
- Semivolatile Organic Compounds Tables F-11 and F-12 present the results of the laboratory quality control data for semivolatile organic compounds in soils. Three soil samples (B1-1-15, B1-2-15, and B1-2-25) were extracted outside the 7-day contract-required holding time set by the CLP for water samples. No holding time criteria have

TABLE F-8. QUALITY CONTROL SUMMARY: MS/MSD-METALS (SOIL SAMPLES) AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

			Accuracy	,				Precisi	on	
Parameter(Units)	MS Total No. Analyses		%R Control Limits	%R No.Accept Analyses*	%R No.Unaccept Analyses*	MSD Total No. Analyses	Range RPD	RPD Limits	RPD No.Accept Analyses*	RPD No.Unaccept Analyses*
TRACE METALS										
Beryllium	, 6	99.4-121.4	65-104	2	4	3	0-3	7	3	0
Cadmium	6	97.0-126.0	59-124	5	i	3	2-7	7	3	Ŏ
Chromium	6	102.1-123.6	65-126	6	Ó	3	1-5	8	3	ŏ
Copper	6	93.8-119.4	67-123	6	Õ '	3	1-3	5	3	Ŏ
Lead	1	138.4	60-131	Ŏ	i	Ĭ	•	6	-	· ·
Mercury	1	102.5	73-121	1	Ó	1	-	12	•	-
Nickel	6	97.9-123.8	68-130	6	Ó	3	1-4	6	3	0
Selenium	2	80-102	57-137	2	Ō	1	24	14	Ō	Ī
Silver	6	90.9-106.7	40-120	6	Ŏ	3	2-4	6	3	Ò
Zinc	6	101.5-125.9	68-126	6	Ŏ	3	1-3	5	3	Ŏ

^{*}Acceptable and unacceptable are based on control limits only.

TABLE F-9. LABORATORY QUALITY CONTROL SUMMARY: MS/MSD-VOLATILE ORGANIC (SOIL SAMPLES) AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

			Accurac	У				Precisi	on	
Parameter(Units)		Percent Recovery Ranges		No.Accept Analyses*	No.Unaccept Analyses*	MSD Total No. Analyses	Range RPD	RPD Limits	RPD No.Accept Analyses*	RPD No.Unaccept Analyses*
SW Method 8240 Volatile Organics										
Benzene Chlorobenzene 1,1-Dichloroethene Toluene Trichloroethene	8 8 8 8	82-123 79-95 84-105 87-101 82-93	66-142 60-133 59-172 59-139 62-137	8 8 8 8	0 0 0 0	4 4 4 4	3-10 1-8 2-9 0-8 3-7	21 21 22 21 24	4 4 4 4	0 0 0 0

^{*}Acceptable and unacceptable are based on control limits only.

TABLE F-10. LABORATORY QUALITY CONTROL SUMMARY: SURROGATE RECOVERY-VOLATILE ORGANICS (SOIL SAMPLES) AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Parameter (Units)		Recovery			No.Unaccept Analysis*
SW Method 8240 Volatile Organics					
Bromofluorobenzene 1,2-Dichloroethane - d4 Toluene - d8	64	80-117 91-117 57-113	74-121 70-121 81-117	64 64 62	0 0 2

^{*}Acceptable and unacceptable are based on control limits only.

TABLE F-11. LABORATORY QUALITY CONTROL SUMMARY: MS/MSD-SEMIVOLATILE ORGANICS (SOIL SAMPLES) AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

			Accu	racy				Precisi	on	
Parameter(Units)	MS Total No. Analyses			No.Accept Analyses*	No.Unaccept Analyses*	MSD Total No. Analyses		RPD Limits	RPD No.Accept Analyses*	RPD No.Unaccept Analyses*
SW Method 3550/8270 Extractable Organics										
Acenaphthene 4-Chloro-3-meth/lphenol 2-Chlorophenol 1,4-Dichlorobenzene 2,4-Dinitrotoluene 4-Nitrophenol N-Nitroso-di-n-propylamine Pentachlorophenol Phenol Pyrene 1,2,4-Trichlorobenzene	88888888888888888888888888888888888888	72-86 73-85 60-73 67-78 63-91 58-89 78-90 58-68 68-81 73-101 73-80	31-137 26-103 25-102 28-104 28-89 11-114 41-126 17-109 26-90 35-142 38-107	8 8 8 8 8 8 8 8 8 8	0 0 0 1 0 0 0	444444444444	6-8 3-4 3-8 0-11 7-18 4-8 0-7 2-17 1-7 4-10	19 33 50 27 47 50 38 47 35 36 23	444444444444444444444444444444444444444	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

^{*}Acceptable and unacceptable are based on control limits only.

TABLE F-12. LABORATORY QUALITY CONTROL SUMMARY: SURROGATE RECOVERY-SEMIVOLATILE ORGANICS (SOIL SAMPLES) AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Parameter (Units)	Total Number Analyses	Percent Recovery Ranges	Percent Recovery Control Limits		No.Unaccept Analyses
SW Method 3550/8270 Extractable Organics				· · · · · · · · · · · · · · · · · · ·	
Azobenzene -d10	0	-	-	-	-
2-Bromophenol	58	47-80	-		•
2-Fluorobiphenyl	58	60-92	30-115	58	0
2-Fluorophenol	58	57-93	25-121	53	0
Nitrobenzene - d5	58	57-130	23-120	57	1
Phenol - d5	58	57-91	24-113	58	0
p-Terphenyl - d14		70-98	18-137	58	Ŏ
2,4,6-Tribromophenol		57-91	19-122	58	Ŏ

^{*}Acceptable and unacceptable are based on control limits only.

been set for extraction and analysis of soil samples for SVOCs; however, these samples were extracted within the 14-day holding time recommended in SW-845, Third Edition and the QA/QC plan for SDANG. Therefore, the holding time requirements for extraction and analysis are considered to have been met. All remaining soil samples were extracted within 7 days and analyzed within 40 days. All GC/MS tuning and mass calibration criteria were met. The following initial and continuing calibration criteria were met: the minimum response factor for system performance check compounds (SPCCs) was greater than or equal to 0.050 in both initial and continuing calibration analyses, the maximum percent relative standard (RSD) deviation for calibration check compounds (CCC) was greater than 30 in initial calibrations, and the maximum percent difference was less than or equal to 25 for continuing calibrations. The percent differences of the following compounds were greater than 25 in one or more continuing calibration analyses: bis-2chloroisopropylether, 3,3'-dichlorobenzidine, bis-2-ethylhexylphthlate, indeno (1,2,3cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene. No corrective action was taken, since all SPCC and CCC criteria were met. Five soil method blanks were analyzed. Bis(2-ethylhexyl)phthlate was detected in one blank associated with soil samples from borings at Site 3 – Base Fire Training Area (B3) and monitoring wells at Site 1 – Underground Fuel Storage Area (MIO1) at a concentration of 22 µg/Kg. This compound also was detected in the method blank associated with sample B1-1-25 but at a concentration below the sample detection limit. All concentrations of bis(2-ethylhexyl)phthlate detected in the environmental samples associated with these method blanks are flagged to indicate possible laboratory contamination. All surrogate recoveries were within the contract-required control limits except for d5-nitrobenzene (130 percent) in sample B3-3-2.5. Since only one surrogate was outside the control limit, the sample extraction efficiency is considered to be acceptable. Four MS/MSD analyses were conducted on soil samples B1-1-25, MW-1-12-15, MW-1-6-15DUP, and B3-2-0. All percent recoveries and RPD values were within the CLP-advisory control limits for soils except 2,4-dinitrotoluene in sample MW-1-6-15DUP which at 91 percent, is slightly greater than the advisory limit (89 percent). This result is not considered to impact the validity of the analytical data and is considered to be within the acceptable range of laboratory accuracy and precision.

Total Petroleum Hydrocarbons and Total Organic Carbon — Table F-13 shows the results of the laboratory quality control data for total petroleum hydrocarbons and total organic carbon analyses in soils. No holding time criteria have been established by the EPA for the extraction and analysis of soil samples for TPH and TOC; therefore, no objective judgment of the integrity of the data based on the length of time allowed to elapse between sample collection and analysis for these two parameters can be made. All soil samples were extracted and analyzed for TPH between 36 and 55 days after the collection date. In all cases, all analyses were conducted on the same day the samples were extracted. Preparation times of soil samples to be analyzed for TOC varied from 10 to 29 days after collection, and analysis was conducted 3 to 25 days after extraction. No reportable concentrations of TPH were detected in the method blanks analyzed with the soil samples. Two initial calibration and four continuing calibration verifications were conducted. While there are no contract-required control limits, one TPH recovery (128) percent) could be considered high. The remainder of the verifications (104 to 112 percent) were well within what would normally be considered acceptable control ranges (80 to 120 percent). Four soil samples (B3-3-0DUP, MW-1-5-15, MW-1-13-15, and BK3-20) were used for the MS/MSD analyses. All percent recoveries and two RPD values were greater than the upper control limit (114 and 13 percent, respectively). The recoveries of TPH in four method blank spikes conducted were within the control limits, suggesting that while the analysis was conducted properly, the enhanced spike results and greater-than-desired analytical variability were due either to the native soil matrix or to the sample holding

TABLE F-13. LABORATORY QUALITY CONTROL SUMMARY: MS/MSD-TOC AND TPH (SOIL SAMPLES) AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

			Accurac	У			***************************************	Precisi	on	
Parameter(Units)	MS Total No. Analyses	Percent Recovery Range(s)	XR Control Limits	XR No.Accept Analyses*	%R No.Unaccept Analyses*	MSD Total No. Analyses	Range RPD	RPD Limits	RPD No.Accept Analyses*	RPD No.Unaccept Analyses*
TOC (dry basis) TPH (dry basis)	4 8	50-100 116-159	50-150 82-114	4 0	0	2 4	0-21 1-22	30 13	2 2	0 2

^{*}Acceptable and unacceptable are based on control limits only.

times. Based on these QC results, all soil TPH values should be considered lower estimates. Two initial TOC calibration and three continuing TOC calibration verification analyses were conducted. Using the same arbitrary control limits for percent recovery set for TPH, all percent recoveries were within the 80 to 120 percent control limit. TOC was detected in one initial calibration and three continuing calibration blanks at concentrations varying from 0.1 to 0.3 percent. These results are less than five times the method detection limit (0.1 percent). MS/MSD analyses were conducted on two soil samples (MW-1-7-15 and BK2-25). The percent recoveries (18 and 17 percent) of one MS/MSD (BK2-25) were less than the lower control limit (50 percent). The percent recoveries calculated from the MW-1-7-15 MS/MSD (81 and 100 percent) were within the control limits (50 to 150 percent). Two LCS samples were analyzed in conjunction with the soil samples. The RPD values (21 and 6 percent) calculated from the MS/MSD analyses were within the control limits (30 percent). The percent recoveries (99 and 105 percent) of both analyses were well within the EPA control limits (85 to 115 percent). The LCS analyses are considered to be more indicative of the analytical accuracy than the artificially spiked soils samples.

### F.2.3 Laboratory Analysis for Groundwater

## F.2.3.1 Summary of Procedures and Equipment

The following subsection briefly summarizes of the protocols and instrumentation used to extract and analyze groundwater and QC field blanks collected at the Base. Tables F-14 and F-15 list the analytical methods, detection limits, and the total number of groundwater samples collected during the RI.

- Trace Metals All groundwater and field QC samples were analyzed using the EPA protocols described in the Test Method For Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Third Edition. Antimony (3005/7041), arsenic (3050/7060), lead (3020/7421), selenium (3050/7740), and thallium (3020/7841) were analyzed using graphite furnace atomic absorption; mercury (7470) was analyzed by cold vapor generation; and the remainder of the metals were analyzed by ICAP spectroscopy (3005/6010).
- Volatile Organic Compounds All groundwater and field QC samples were analyzed for VOCs using the EPA solid waste protocols described in SW-846 Method 8240. A 5-mL sample was purged directly in a specially designed sparger and then analyzed using GC/MS. Surrogate and internal standard compounds were added to the sample immediately before purging. Compounds were identified by comparing the ion chromatograms of the suspected analytes with the ion chromatograms of CLP target compounds contained in the MS data system.
- Semivolatile Organic Compounds All groundwater and field QC samples were analyzed for SVOCs using the EPA solid waste protocols described in SW-846 Method 8270. Using this method, a 1.0-liter groundwater or field QC sample was prepared by liquid-liquid extraction (EPA Method 3510) using a methylene chloride/acetone mixture. Radio-labeled surrogate compounds were added to the sample before extraction. After the extraction was completed, the solvent was concentrated to a final volume of 1.0 mL. Compounds used for quantitation of target compounds (i.e., internal stand rds) were added to the sample extract before instrumentational analysis. Target compounds were identified in the same manner as described for VOCs.

TABLE F-14. LABORATORY ANALYTICAL METHODS, DETECTION LIMITS AND TOTAL NUMBER OF WATER SAMPLES AT SOUTH DAKOLA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOLA

Parameter	Analytical Method	Detection Limit	Reporting Units	Number of Analyses	Trip Blanks	Field Blanks	Equipment Blanks	Replicates	Total Analyses
Petroleum Kydrocarbons	E 418.1	0.5	7/6#	25	NA	2	7	70	36
Priority Pullutant Metals Screen	0;09 /902 AS	*	1/6#	Ŋ	¥	***	<b>~</b>	<b>-</b>	٥
Arsenic	0902 1000 1000	īv	#9/L	52	¥	7	4	ľ	36
Antimony	SK 3005/ 7041	រក	#g/L	ŗ.	¥	-	~	2	10
Lead	SW 3020/ 7421	-	µ9/L	25	¥	2	*	ľ	36
Mercury	0272 MS	0.2	#8/F	5	NA	•-	8	•	٥
Selenium	SN 3050/ 7740	'n	µg/L	ľ	<b>X</b>	-	∾ ့	<del></del>	٥
Thallium	SW 3020/ 7841	'n	μg/L	เก	¥		2	<b>-</b>	٥
Volatile Organic Compounds (VOCs)	0528 NS	*	μg/L	52	m	8	4	ın	39
Semivelatile Organic Compourds (SVOfa)	SW 3510/ 8270	*	µg/L	S	¥	~	4	ĸ	36
Water Quality Parameters:									
Common Anions (Sulfate, Chluride, Nitrate	EP 300.0	1 1 0.2	mg/L	7	0	0	0	O	2
Common ' Zions- Calcium Manganese, Iron Sodium Magnesium	SW 7140 SW 6010 SW 7770 SW 7450	พะพพ	mg/r mg/r mg/r mg/r	กกกก	0000	0000	0000	0000	ผผผผ
Total Dissolved Solids	EP 160.1	-	mg/L	۲۵	0	0	0	0	7
Total Suspended Solids	EP 160.2	-	mg/L	~	0	0	0	0	2
Alkalinity (Total, Bicarbonate, Carbonate)	EP 310.1	8	mg/L	۲,	င	င	0	0	8
¥	SW 9040	V.	Units	2	0	0	0	0	2

TABLE F-15. CRDLs FOR GROUNDWATER SAMPLES AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA

Parameter	CRDL	Units	Parameter	CRDL	Units
INORGANICS			2-Chloronapthalene	2	μg/L
Dissolved Antimony	5 5	μg/L	2-Chlorophenol	2	μg/L
Dissolved Arsenic		μg/L	4-Chlorophenyl phenylether	2222422	μg/L
Dissolved Beryllium	1	μg/L	Chrysene	2	μg/L
Dissolved Cadmium Dissolved Chromium	1	μg/L	Dibenzofuran	2	μg/L
Dissolved Copper	i	μg/L μg/L	Dibenzo(a,h)anthracene 1,2-Dichlorobenzene	4	μg/L μg/L
Dissolved Lead	i	μg/L μg/L	1,3-Dichlorobenzene	5	μg/L μg/L
Total Mercury	0.2	μg/L	1.4-Dichlorobenzene	2	μg/L
Dissolved Nickel	2	μg/L	3,3'-Dichlorobenzidine 2,4-Dichorophenol Diethyl phthalate 2,4-Dimethyl phonol	20	μg/L
Dissolved Selenium	5	μg/L	2,4-Dichorophenol	4	μg/L
Dissolved Silver	1	μg/L	Diethyl phthalate	2	μg/L
Dissolved Thallium	5	μg/L	2,4-Dimethylphenol Dimethyl phthalate Di-n-butyl phthalate	2	μg/L
Dissolved Zinc	1	μg/L	Dimethyl phthalate	2	μg/L
TPH OIL & GREASE	0.5	ua /I	or it become promote to	2	μg/L
IFH OIL & GREASE	0.5	μg/L	4,6-Dinitro-2-Methylphenol 2,4-Dinitrophenol	20	μg/L μg/L
VOLATILE ORGANICS (BY GC/MS	:		2,4-Dinitrophenot 2,4-Dinitrotoluene 2,6-Dinitrotoluene Di-n-octyl phthalate Flouranthene Flourene Hexachlorobenzene	4	μg/L μg/L
Acetone	´ 5	μg/L	2.6-Dinitrotoluene	4	μg/L
Benzene	1	μg/L	Di-n-octyl phthalate	ż	μg/L
Bromodichloromethane	1	μg/L	Flouranthene	2	μg/L
Bromoform	1	μg/L	Flourene	2 2 4 2 4	μg/L
Bromomethane	1	μg/L	HEAGOITTO ODELLECITE	4	μg/L
2-Butanone	. 3	μg/L	Hexachlorobutadiene	2	μg/L
Carbon Disulfide	' 1	μg/L	Hexachlorocyclopentadiene	4	μg/L
Bromotorm Bromomethane 2-Butanone Carbon Disulfide Carbon Tetrachloride Chlorobenzene	1	μg/L	Hexachloroethane	4	μg/L
Carbon Tetrachloride Chlorobenzene Chloroethane	3	μg/L μg/L	Indeno(1,2,3-cd)pyrene Isophorone	4 2 2 2 2 4	μg/L
Chloroform	1	μ9/L μg/L	2-Methylnapthalene	5	μg/L μg/L
Chloromethane	i	μg/L μg/L	2-Methythapthatene 2-Methylphenol	5	μg/L μg/L
cis-1,3-Dichloropropene	3	μg/L	4-Methylphenol	2	μg/L
cis-1,3-Dichloropropene Dibromochloromethane	3	μg/L	Napthalene	4	μg/L
1,1-Dichloroethene		μg/L	2-Nitroaniline	4	μg/L
1,1-Dichloroethane	1	μg/L	3-Nitroaniline	10	μg/L
1,2-Dichloroethane	1	μg/L	4-Nitroaniline	4	μg/L
1,2-Dichloroethene (total)	1	μg/L	Nitrobenzene	Ş	μg/L
1,2-Dichloropropane Ethylbenzene	1 1	μg/L	2-Nitrophenol	4	μg/L
2-Hexanone	3	μg/L μg/L	4-Nitrophenol N-Nitrosodiphenylamine(1)	20 2	μg/L
Methylene Chloride	1	μg/L	N-Nitroso-di-n-propylamine	2	μg/L μg/L
4-Methyl-2-Pentanone	3	μg/L	Pentachlorophenol	20	μg/L
Styren	1	μg/L	Phenanthrene	ž	μg/L
Tetrachloroethene	1	μg/L	Phenol	2 2 2 2	μg/L
1,1,2,2-Tetrachloroethane	3	μg/L	Pyrene	2	μg/L
1,1,1-irichloroethane	1	μg/L	1,2,4-Trichlorobenzene 2,4.5-Trichlorobenol		μg/L
1,1,2-Trichloroethane	1	μg/L	_, .,	4	μg/L
Toluene	1	μg/L	2,4,6-Trichlorophenol	4	μg/L
Total Xylenes Trans-1,3-dichloropropene	3	μg/L μg/L	OTHER INORGANICS		
Trichloroethene		μg/L μg/L	Bicarbonate Alkalinity	2	ma /1
Vinyl Acetate	i	μg/L	Carbonate Alkalinity	2	mg/L mg/L
Vinyl Chloride	i	μg/L	Chloride	ī	mg/L
		,	Dissolved Calcium	5	mg/L
SEMI-VOLATILES (BY GC/MS)			Dissolved Iron	5	ug/L
Acenaphthene	2	μg/L	Dissolved Magnesium	5	mg/L
Acenaphthylene	2	μg/L	Dissolved Manganese	1	ug/L
Anthracene	2	μg/L	Dissolved Sodium	5	mg/L
Benzoic Acid Benzo(a)anthracene	50 2	μg/L	Kitrate	0.2	mg/L
Benzo(a)pyrene	4	μg/L μg/L	pH Sulfate	NA 1	Units
Benzo(b)flouranthene	4	μg/L	Total Alkalinity	ż	mg/L mg/L
Benzo(g,h,i)perylene	4	μg/L	Total Dissolved Solids	1	mg/L
Benzo(k)flouranthene	4	μg/L	Total Suspended Solids	i	mg/L
Benzyl alcohol	2	μg/L	•	-	
Bis(2-chloroethoxy)methane	2	μg/L			
Bis(2-chloroethyl)ether	2	μg/L			
Bis(2-chloroisopropyl)ether	. 2	μg/L			
Bis(2-ethylhexyl)phthalate	2	μg/L			
4-Bromophenyl phenylether	4	μg/L			
Butylbenzyl phthalate	2 2	μg/L			
4-Chloroaniline 4-Chloro-3-methylphenol	4	μg/L μg/L			
4 Girtoi o-3-methytphenot		49/ L			

• Total Petroleum Hydrocarbons and Miscellaneous Inorganics — All ground-water, surface water, and field QC samples were analyzed for TPH using EPA Method 418.1, common anions using EPA Method 300.0 (ion chromatography), total dissolved solids (TDS) using EPA Method 160.1, total suspended solids (TSS) using EPA Method 160.2, and alkalinity using EPA Method 310.1.

#### F.2.3.2 Quality Assurance Review and Results

Subsection F.1.3.2 summarizes significant findings of the QA review of the data derived from the analysis of groundwater and field QC samples associated with the groundwater samples collected at SDANG. This summary discusses the following analytical criteria where applicable: holding time requirements, calibration, method required blanks (e.g., preparation blanks, reagent blanks), surrogate recoveries, MS/MSD results, instrument tuning, and LCS analyses. The required holding times, along with container types and preservatives for each analytes, are given in Table F-16.

• Trace Metals — A summary of the quality control checks for metals in groundwater samples is provided in Table F-17. All contract-required holding times for trace metals (6 months) and mercury (28 days) were met, except for three field QC blank samples (EB-4, EB-5, and FB-1), which were analyzed for mercury as many as 6 days after the contractrequired holding time (28 days). FB-1 was digested on day 28, but analyzed on day 30. The holding time recommended for this method does not differentiate between preparation and analysis; therefore, the later holding time for FB-1 was used in this evaluation. All initial and continuing calibration verification criteria were met. Zinc was detected at a concentration of 5 µg/L in one water preparation blank associated with the water samples. No corrective action was implemented on the basis of this blank, since the concentration was exactly equal to five times the CRDL. Had the concentration been greater than five times the CRDL, corrective action procedures would have been initiated. One ICAP ICS analysis was conducted. All percent recoveries were within the control limits (80-120 percent). MS/MSD analyses were conducted on the following samples: EB-1 (arsenic), EB-4 (selenium and mercury), EB-11 (copper, silver, beryllium, nickel, lead, cadmium, chromium, thallium and zinc), FB-2 (antimony), MW-1-1 (iron and manganese), MW-1-3 (lead), MW-1-11 (arsenic), EB-15 (lead), and GW1-1 (arsenic). The percent recovery (15 percent) of silver in EB-11 was less than the lower control limit (77 percent) in one matrix spike analysis. This result was most likely due to this element not having been sufficiently resolubilized after digestion of the matrix spike. Since the percent recovery of silver in the MSD analysis (96 percent) was within the control limit (77-120 percent), the matrix spike recovery is considered to be an anomalous occurrence. The percent recovery of mercury in EB-4 (129 percent) was greater than the upper control limit (123 percent). The percent recoveries of iron in MW-1-1 (1,100 and 1,000 percent) were greater than the upper control limit (138 percent). The antimony RPD value calculated from the MS/MSD analyses of FB-2 (33 percent) was greater than the upper control limit (16 percent) for duplicate analyses; however, the MS/MSD percent recoveries (59 and 83 percent) were within the control limits (40-150 percent). A post-digestion spike analysis was performed, and no matrix interference from the sample was documented; therefore, the cause of variability in the spike analyses is unknown. Because antimony was not detected in the samples submitted and the spike results were acceptable, the RPD result is not considered to have any impact on the analytical data. One spiked sample analysis was conducted. All percent recoveries were within the control limits except for manganese (128 percent),

TABLE F-16. SAMPLE CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES OF GROUNDWATER SAMPLES ACCORDING. TO MEASUREMENT AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Measurement	Container Type	Preservative	Holding Time
ORGANICS Purgeable Organics Extractable Organics Total Petroleum Hydrocarbons	Four 40 ml. glass vials* Three 1.0L glass bottles* Two 1.0L glass bottles*	4° C 4° C 4° C H2SO4 to pH <2, 4° C	14 days 7 days extraction, 40 days analysis 28 days
INORGANICS Total Recoverable Metals Arsenic, Lead, Selenium Mercury	One 500 mL plastic bottle One 500 mL plastic bottle One 500 mL plastic bottle	HNO3 to PH <2 HNO3 to PH <2 HNO3 to PH <2	6 months 6 months 30 days
MISCELLANEOUS INORGANICS Common Anions Total Dissolved Solids Total Suspended Solids	One 1.0L plastic bottle One 1.0L plastic bottle One 1.0L plastic bottle	H2SO4 to pH <2, 4° C 4° C 4° C	
pH Total Alkalinity as CaCO3 Nitrate/Nitrite	One 500 mL plastic bottle One 500 mL plastic bottle One 1.0L plastic bottle	4° C 4° C H2SO4 to pH <2, 4° C	6 hours 14 days 24 hours

TABLE F-17. LABORATORY QUALITY CONTROL SUMMARY: MS/MSD-METALS (GROUNDWATER SAMPLES) AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA

			Accuracy	/				Precisi	on	
Parameter(Units)	MS Total No. Analyses		%R Control Limits	%R No.Accept Analyses*	%R No.Unaccept Analyses*	MSD Total No. Analyses	Range RPD	RPD Limits		RPD No.Unaccept Analyses*
TRACE METALS										
Antimony	. 2	59.4-83.2	40-150	2	0	1	33.4	16	0	1
Arsenic	6	87.7-100.0	57-131	6	0	3	0.0-7	7	3	Q
Beryllium	2	98.4-107.6	73-116	2	0	1	8.9	29	1	0
Cadmium	2	100-105.4	66-123	2	0	1	5.3	5	0	1
Chromium	2	98.8-100.4	67-127	2	0	1	1.6	6	1	0
Copper	2	99.4-101.6	65-122	2	0	1	2.2	7	1	0
Iron	2	1018.8-1064.8	43-138	0	2	1	4.4	23	1	0
Lead	6	99.2-121.5	66-124	6	0	3	1.1-15	7	2	1
Manganese	Ž	218.0-256.0	•	-	-	1	16.0	20	1	0
Mercury	Ž	123.0-129.0	79-123	1	1	1	4.8	5	1	0
Nickel	ž	96.2-99.6	66-125	2	Ó	1	3.5	5	1	0
Selenium	ž	107.5-110.0	66-131	2	0	1	2.3	7	1	0
Silver	Ž	14.8-95.6	77-120	1	1	1	159.6	7	0	1
Thallium	ž	90.4-94.4	40-150	ż	Ò	i	4.3	ģ	1	0
Zinc	2	96.2-97.2	64-127	ž	Ŏ	1	1.0	6	1	0

^{*}Acceptable and unacceptable are based on control limits only.

- which was slightly greater than the upper control limit (117 percent). This result is most likely due to an insufficient concentration of manganese added to the sample, since manganese was detected in the unspiked sample at a concentration of  $2,125\,\mu g/L$ , yet only 100  $\mu g/L$  was added to the sample. This result is not considered to be significant or to negatively impact the other sample results. Two LCS analyses were conducted. All percent recoveries were within the limits set by the EPA. One ICP (initial and final) and one GFAA CRDL verification standard were analyzed. Although the EPA has not established control limits for this QC check analysis, any positive recovery greater than zero is considered acceptable. The lowest percent recovery reported from the CRDL analyses was 67 percent for chromium, and the highest percent recovery was 610 percent for lead.
- Volatile Organic Compounds/VOCs Summaries of the quality controls checks for volatile organic compounds in groundwater samples are given in Table F-18 and F-19. All groundwater, surface water, and field QC blank samples were analyzed within the 14-day holding time. All GC/MS tuning and mass calibration criteria were met. All initial calibration SPCC and CCC criteria were met. The relative response factors for all compounds were greater than 0.05, and all percent RSD values were less than 30. All continuing calibration SPCC and CCC criteria were met; however, the percent differences of the following compounds were greater than 25 in one or more continuing calibration verification analyses: chloromethane, bromomethane, chloroethane, carbon disulfide, 1,2dichloroethene, carbon tetrachloride, trichloroethene, xylene, acetone, tetrachloroethane, vinyl acetate, bromodichloromethane, dibromochloromethane, cis-1,3-dichloropropene, bromoform, methyl isopropyl ketone, tetrachloroethene, and styrene. No corrective action was taken since all SPCC and CCC criteria were met. Ten method blanks were analyzed in association with the water samples collected at SDANG. Methylene chloride was detected at a concentration of 1 µg/L in the method blank associated with EB-12, EB-13, EB-14, and FB-2. Methylene chloride was also detected in each of the four field QC blanks at a concentration of 2 µg/L. These results were flagged with a "B" to indicate the method blank results. No corrective action was conducted as a result since the concentration detected in the method blank was less than five times the CRDL. All surrogate recovery criteria were met. All percent recoveries and RPD values calculated from the four MS/MSD analyses were within the control limits for this method.
- Semivolatile Organic Compounds/SVOCs Tables F-20 and F-21 present the results of the laboratory quality control data in groundwater. EB-12, EB-13, EB-14, FB-2, MW-1-1, and MW-1-4 were extracted 8 to 11 days after the date of collection, exceeding the contract-required holding time by 1 to 3 days. All other holding times were met. All tuning and mass calibration criteria were met. All initial calibration SPCC and CCC criteria were met. In addition, the R&F and percent RSD criteria for all target compounds were greater than 0.05 and less than 30 percent, respectively. All continuing calibration SPCC and CCC criteria were met. The percent differences of the following compounds were greater than 25 in one or more continuing calibration analyses: bis(2chloroisopropyl)ether, 3,3'-dichlorobenzidine, bis(2-ethylhexyl)phthlate, indeno(1,2,3cd)pyrene, dibenzo(a,h)anthracene, benzyl alcohol, 4-chloroaniline, hexachloropentadiene, n-nitroso-di-n-propylamine, benzoic acid, 4-nitroaniline, hexachlorobutadiene, 2,4,6-tribromophenol, bis(2-chloroethylvinyl)ether, 2,4-dinitrophenol, aniline, and benzo(g,h,i)perylene. No corrective action was taken since all SPCC and CCC criteria were met. Ten method blanks were analyzed. No interferents were detected for except bis(2-ethylhexyl)phthlate (2 µg/L) in the method blank associated with MW-1-10, MW-1-11, and MW-1-12DUP. No corrective action was taken since this concentration is less than the five times the CRDL. Surrogate recoveries in 33 water samples were outside the control limits in the original analysis. All samples were re-analyzed. One or more

TABLE F-18. LABORATORY QUALITY CONTROL SUMMARY: MS/MSD-VOLATILE ORGANIC (GROUNDWATER SAMPLES)
AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

			Accurac	У				Precisi	on	
Parameter(Units)	MS Total No. Analyses	Percent Recovery Ranges	%R Control Limits	No.Accept Analyses*	No.Unaccept Analyses*	MSD Total No. Analyses	Range RPD	RPD Limits	RPD No.Accept Analyses*	RPD . No.Unaccept Analyses*
SW Method 8240 Volatile Organics								· · · · · · · · · · · · · · · · · · ·		
Benzene Chlorobenzene 1,1-Dichloroethene Toluene Trichloroethene	8 8 8 8	104-116 85-111 88-127 88-111 76-118	76-127 75-130 61-145 76-125 71-120	8 8 8 8	0 0 0 0	. 4 4 4 4	0-3 1-3 0-5 0-3 0-5	11 13 14 13 14	4 4 4 4	0 0 0 0

TABLE F-19. LABORATORY QUALITY CONTROL SUMMARY: SURROGATE RECOVERY-VOLATILE ORGANIC COMPOUNDS (GROUNDWATER SAMPLES)
AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Parameter (Units)	Number	Percent Recovery Ranges			No.Unaccept Analysis*
SW Method 8240 Volatile Organics					
Bromofluorobenzene 1,2-Dichloroethane - d4 Toluene - d8	84	91-114 84-111 91-110	86-115 76-114 88-110	84 84 84	0 0 0

^{*}Acceptable and unacceptable are based on control limits only.

TABLE F-20. LABORATORY QUALITY CONTROL SUMMARY: MS/MSD-SEMIVOLATILE ORGANIC (GROUNDWATER SAMPLES) AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

			Accu	гасу				Precisi	on ,	
Parameter(Units)	MS Total No. Analyses	Range Percent Recovery			No.Unaccept Analyses*	MSD Tctal No. Analyses		RPD Limits	RPD No.Accept Analyses*	RPD No.Unaccept Analyses
SW Method 3510/8270 Extractable Organics		x								
Acenaphthene 4-Chloro-3-methylphenol	8 8	67-89 43-85	46-118 23-97	. 8	0	4	4-9 3-35 1-21	31 42 40	4	0
2-Chlorophenol 1,4-Dichlorobenzene 2,4-Dinitrotoluene	8 8	55-89 58-91 64-81	27-123 36-97 24-96	8 8	0	4	0-11 0-4	28 38	4	0
4-Nitrophenol N-Nitroso-di-n-propylamine Pentachlorophenol	8 8	26-59 64-98 67-78	10-80 41-116 9-103	8 8 8	0	4 4 4	3-13 0-9 1-4	50 38 50	4	0 0 0
Phenol Phenol Pyrene	8 8	30-58 76-109	12-89 26-127	8 8	0	4	0-9 2-10	42 31	4	0
1,2,4-Trichlorobenzene	8	63-97	39-98	8	0	4	2-10	28	4	0

^{*}Acceptable and unacceptable are based on control limits only.

TABLE F-21. LABORATORY QUALITY CONTROL SUMMARY: SURROGATE RECOVERY - SEMIVOLATILE ORGANIC COMPOUNDS (GROUNDWATER SAMPLES)
AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Parameter (Units)	Total Number Analyses	Percent Recovery Ranges	Percent Recovery Control Limits	No.Accept Analyses	No.Unaccept Analyses
SW Method 3550/8270 Extractable Organics					
Azobenzene - d10 2-Bromophenol	81	61-86 1-78	49-123 28-119	23 20	0
2-Fluorobiphenyl 2-Fluorophenol Nitrobenzene - d5	88	51-92 0-73 49-98	43-116 21-100 35-114	88 49 88	0 39 0
Phenol - d5 p-Terphenyl - d14	88	0-55 28-93	10-94 33-141	57 87	31 1
2,4,6-Tribromophenol	88	2-88	10-123	84	4

^{*}Acceptable and unacceptable are based on control limits only.

- surrogate recoveries remained outside the control limits in 18 samples due to matrix interference by CLP definition. MS/MSD analyses were conducted on four water samples. All percent recoveries and RPD values were within the CLP control limits.
- Total Petroleum Hydrocarbons and Miscellaneous Inorganics Table F-22 presents the results of the laboratory quality control data for total petroleum hydrocarbons in groundwater. Fifty-five groundwater, surface water, and field QC blank samples were submitted for TPH analysis. Thirty-six of these samples were extracted and analyzed outside the 28-day holding time. Twelve samples were extracted 5 days after the holding time, 13 samples after 6 days, 2 samples after 8 days, 2 samples after 12 days, 1 sample after 19 days, 4 samples after 21 days, 1 sample after 25 days, and 1 sample after 26 days. In all cases, the samples were analyzed on the same days that they were extracted to minimize any further deterioration due to sample holding considerations. All initial and continuing calibration verification analyses were within control limits. In addition, no interferents were detected in the associated initial and continuing calibration blanks. Four procedural (method) blanks were analyzed in association with the water samples collected at SDANG. TPH was detected in two procedural blanks at concentrations (1.1 and 0.7) mg/L) less than three times the method detection limit. MS/MSD analyses were conducted on five groundwater and field QC blank samples (MW-1-14, MW3-2, FB-2, FB-3, and GW1-11). All percent recoveries and RPD values calculated were within the internal laboratory control limits (74 to 126 percent). Three blank spike analyses were conducted. All recoveries (110 to 117 percent) were within the 75 to 125 percent control limit. Duplicate analyses were conducted on 2 samples, MW-1-14 and FB-2. TPH was undetected in both samples; therefore, a quantitative assessment of analytical precision cannot be made. Qualitatively, laboratory precision appears to be in control with two duplicate nondetectable values. Two groundwater samples (MW-1-1 and MW-1-3) were analyzed for common anions (i.e., nitrate, chloride, and sulfate), total alkalinity, TDS, and TSS. The recommended holding time for TDS and TSS analyses (7 days) was exceeded on MW-1-3 (21 and 16 days, respectively). The recommended holding time (14 days) for alkalinity was also exceed for this sample (28 days). The recommended holding time (28 days for chloride and sulfate analysis and 48 hours for nitrate analysis) for common anion analysis was exceeded for MW-1-1 and MW-1-3 30 days). The sulfate and chloride results are not considered to have been affected by the length of time the samples were held before analysis; however, analyses that are very sensitive to changes in pH and exposure to air will be significantly affected by the length of time these samples are held before analysis. Therefore, all analytical data from the nitrate, alkalinity, and residue analyses should be considered lower estimates. All other QC check analyses (i.e., calibration verification, method blank, matrix spike, duplicate analyses) for residue, common anions, and alkalinity analyses were within control limits.

TABLE F-22. LABORATORY QUALITY CONTROL SUMMARY: MS/MSD-TPH (GROUNDWATER SAMPLES) AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

			Accurac	у				Precisi	on	
Parameter(Units)					%R No.Unaccept Analyses*	MSD Total No. Analyses		RPD Limits	RPD No.Accept Analyses*	RPD No.Unaccept Analyses*
TPH	10	89-118	74-126	10	0	5	0-6	11	5	0

^{*}Acceptable and unacceptable are based on control limits only.

Information concerning abbreviations found on data tables can be found here.

- * These samples were collected in January and filtered in the field. The units were reported as mg/L rather than  $\mu$ g/L; for the sake of consistency, the units were changed to  $\mu$ g/L. The following detection limits also changed: iron (0.01 mg/L) and manganese (0.001 mg/L). If lead was not detected at the ICP detection limit, then GFAA was used to achieve the lower limit to further analyze the samples.
- ** These samples were collected unfiltered in January. The following detection limits changed: sodium (0.5 mg/L), calcium (0.5 mg/L), and magnesium (0.5 mg/L).
- ND This compound/parameter was not detected at or above the detection level.
- NT This compound/parameter was not analyzed in the respective sampling round.
- (B) Compound was detected in the associated method blank.
- (CC) Continuing calibration verification relative response factor outside control limits.
- (D) Dilution analysis. This flag is associated with the (E) flag.
- (E) The analysis was performed and the concentration exceeds the calibration range of the gas chromatograph/mass spectrometer. If one or more of the TCL's is above the detection level, the sample or extract must be reanalyzed for all of the appropriate TCL's. If dilution causes results from the first analysis to be below the detection level, both analyses would be reported.
- (EB) Compound/parameter was also detected in the associated equipment blank.
- (EH) The extraction holding time was exceeded for the respective sample.
- (FB) Compound/parameter was also detected in the associated field blank.
- (I) The ICP interference check sample percent recovery exceeded the control limits in this instance.
- (H) The CLP holding time was exceeded for this compound/element.
- (IC) The initial calibration verification relative response factor was outside the normal control limits.

- (J) Estimated value. This flag is used when the mass spectral data indicates the presence of an analyte but the result is below the sample quantitation level.
- (JB) Indicates that the compound/element was detected in the associated method blank but was at a quantitation level below the normal detection level. This is also an estimation of the true result.
- (JX) A combination of (J) and (X), the compound/element in question coeluted but at a level lower than the minimum level of detection.
- (MD) MS/MSD RPD was outside the established control limits for this analyte.
- (RE) Laboratory re-extractions were performed when questionable results need further justification.
- (S) The surrogate recovery was below the minimum control limits.
- (T) The analyte in question was found to coelute from the gas chromatographic column with a similar analyte also noted. The instrument was not able to effectively separate these two constituents and normally reflects a similar, if not equal, level of contamination.
- (TB) Compound or element also detected in the associated trip blank.
- (U) Indicates the compound was analyzed but not detected.
- (X) Same as (T) but was used in a different round of analysis with similar results.
- MWx-y Site x at Monitoring well y (groundwater sample collected in May).
- GWx-y Site x at Monitoring well y (groundwater sample collected in Jan/Jul).
- SW-x Surface water sample collected at Location x.
- MWx-y-z Site x at Monitoring well y and Depth z(feet) (soil sample).
- Bx-y-z Site x at Soil boring y and Depth z(feet) (background soil sample).
- BKx-y Background soil sample.
- FB-x Field blank.
- EB-x Equipment blank.
- TB-x Trip blank.
- QA-x Quality assurance samples.

QA/QC PROGRAM CHEMICAL ANALYSES

TABLE F-23. SITE 1 - UNDERGROUND FUEL STORAGE AREA WATER QUALITY PARAMETERS FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Parameter	Units	Lower Limit of Detection	GW1-1	HW1-1	GW1-1	GW1-3	MW1-3	6W1-4	6W1-4
TRACE METALS	7 1	u	*70		15	5	5,600	17	130*
Dissolved from	1/6#	<b></b>	\$	2100	Ż	E	2002	=	<u>*</u>
Dissolved Sodium	1/6	· rv	7.3**	12	K	FX.	2	H	17**
Dissolved Calcium	7/6	S	120**	83	N T	¥	160	K	150**
Dissolved Magnesium	mg/L	Ŋ	27**	17	H	H	35	H	32**
MISCELLANEOUS INORGANICS									
Sulfate	mg/L		25	26	¥	Z Z	110(H)	Z	8
Chloride	mg/L		14	15(H)	×	Z	34(H)	Z	28
Nitrate	mg/L	0.2	1	0.3(H)	F	H	웆	Ħ	0.2(U)
issolved	£g/L	-	520(8)	460	K	Z	670	¥	700(B)
Total Suspended Solids	mg/L	-	140	25	Ħ	Z	340	Z	92
Alkalinity	1/bu	2	310	420(H)	H	H	420	H X	450
۰	mg/L	2	310	420(H)	Z	¥	420(H)	H	420
Carbonate Alkalinity	mg/L	~	2(U)	0	Ħ	X	0	×	2(n)
Hd.	Units	N/N	6.3	6.9(H)	NT.	E E	6.9(H)	H	7.0

TABLE F-24. LABORATORY QUALITY CONTROL CHECK SAMPLE SUMMARY FOR METALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

۵.	Parameter	Method Number	Holding Time (days)	me (days)	Initial Calibration Verification	Continuing Calibration Verification	BLANKS Initial Continuing Procedural
) pe	RACE METALS (ICP) Beryllium Cadmium Chromium Copper Nickel Arsenic Zinc	TRACE METALS (ICP) SW 3005/3050/6010 6 Months (preserved pH<2) Beryllium Cadmium Chromium Copper Nickel Arsenic Zinc	6 Konths (	preserved pH<2)	Instruments must be calibrated daily and each time the instrument is set up. A blank and at least one standard must be used in establishing the analytical curve.	ICV and CCV: Analysis results must fall within the control limits of 90-110 %R of the true value.	Criteria: No contaminants should be found in the blanks.
F-49	TRACE HETALS (GFAA) Antimony Arsenic Lead Selenium Thallium	4) Su 3005/7041 Su 3050/7060 Su 3020/3050/7421 Su 3050/7740 Su 3020/3050/7841	6 Months (	6 Months (preserved pH<2)	A blank and at least three standards, one of which must = CRDL, must be used in establishing the analytical curve; also, the correlation coefficient must be >= 0.995. The instrument must be calibrated daily and each time it is set up.	ICV and CCV: Analysis results must fall within the control limits of 90-110 % of the true value.	Criteria: No contaminants should be found in the blanks.
-	TRACE HETALS (CV) Mercury	SW 7470/7471	28 Days (f	28 Days (preserved pH<2)	A blank and at least four standards, must be used in establishing the analytical curve; also, a correlation coefficient must be >=0.995.	ICV and CCV: Analysis results must fall within the control limits of 80-120 %R of the true value.	Criteria: No contaminants should be found in the Stanks.

TABLE F-24. LABORATORY QUALITY CONTROL CHFCK SAMPLE SUMMARY FOR METALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Parameter	Laboratory Control Sample	ACCURACY MS/NSD (XR)	ACCURACY MS/MSD (RPD)	1CP Interference Check Sample	CRDL Standard for AA and ICP	PRECISION Duplicate Analysis
TRACE METALS (ICP) Beryl Lium Cadmium Chromium Copper Nickel Arsenic Zinc	TRACE METALS CONTROL LIMITS: WATERS 80-120%R SOILS (%R) A8 24.6-53.5 A8 45.6-53.5 G4 35.7-55.1	Criteria: 1. Samples used as field blanks cannot be used for spiked sample analysis. 2. Spike XR must be within 75-125% (Note: Spike recovery limits do not apply when the sample concentration exceeds the spike concentration by a factor of 4 or more.)	TRACE METALS  RPD CONTROL LIMITS:  Ag 7 6  As 5  Be 29 7  Cd 5 7  C, 7 5	An ICS must be run S: at the beginning L and end of each sample analysis run (or twice during an 8 hour working shift, whichever is more frequent	XR must be >0%. Criteria: 1. Field 2. A cont (35% fo used fo shall shall	Criteria: 1. Field blanks may not be used. 2. A control (imit of + or - 20.0% (35% for soils) for RPD shall be used for sample values >5% CRDL 3. A control (imit of + or - CRDL shall be used for sample values
TRACE HETALS (GFAA) I Antimony UT Arsenic O Lead Selenium Thallium		Criteria: 1. Samples used as field blanks cannot be used for spiked sample analysis. 2. Spike XR must be within 85-115% (Note: Spike recovery limits do not apply when the sample concentration exceeds the spike concentration by a factor of 4 or more.)	23 - 23 - 23 - 24 - 25 - 23 - 25 - 25 - 25 - 25 - 25 - 25	Not Applicable	%R must be >0%. Criteria: 1. Field 2. A cont (35% fo used) 3. A cont shall	Criteria: 1. Field blanks may not be used. 2. A control limit of + or - 20.0% (35% for soils) for RPD shall be used for sample values >5% CRDL. 3. A control limit of + or - CRDL shall be used for sample values >5% CRDL.
TRACE HETALS (CV) Hercury		Criteria: 1. Samples used as field blanks cannot be used for spiked sample analysis. 2. Spike %R must be within 85-115% (Note: Spike recovery limits do not apply when the sample concentration exceeds the spike concentration by a factor of 4 or more.)		Not Applicable	Not Applicable	Criteria: 1. Field blanks may not be used. 2. A control limit of + or - 20.0% (35% for soils) for RPD shall be used for sample values >5% CRDL. shall be used for sample values >5% CRDL.

TABLE F-25. LABORATORY QUALITY CONTROL CHECK SAMPLE SUMMARY FOR ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD; JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA

Parameter	Method Number	Holding Time (days)	GC/MS Tuning	Initial Calibration Verification
VOLATILE ORGANIC COMPOUND (VOC'S)	SW 8240	Criteria: 7-water (unpreserved) 14-water (preserved)	benzene (BFB) ! ABUNDANCE CRITERIA	2-
F-51		14-soils	50 15.0-40.0% of the base peak 75 30.0-60.0% of the base peak 95 base peak, 100% relative abundance 96 5.0-9.0% of the base peak 173 less than 2.0% of m/z 174 174 greater than 50.0% of the base peak 175 5.0-9.0% of m/z 174 176 greater than 95.0%, but less than 101.0% of the m/z 174 177 5.0-9.0% of m/z 174	2. All XRSD must be <=30.0%
SEMIVOLATILE ORGANIC COMPOUND (SVOC'S)	SEMIVOLATILE ORGANIC SW 3510/SW 8270(WATER) COMPOUND (SVOC'S) SW 3550/SW 8270(S01L)	Must be preserved at 4 degees C. Water samples must be extracted in 7 days	Criteria: Decafluorotriphenylphosphine (DFTPP) m/z ION ABUNDANCE CRITERIA	Criteria: 1. Average RRF for ICL compounds must be >=0.05; however, RRF
		and the extraction must be analyzed in 40 days. Soil samples must be extracted in 14 days and the extract must be analyzed in 40 days.	51 30.0-60.0 % of m/z 198 68 Less than 2.0% of m/z 69 70 Less than 2.0% of m/z 69 127 40.0-60.0% of m/z 198 197 Less than 1% of m/z 198 198 base peak, 100% relative abundance 199 5.0-9.0% of m/z 198 275 10.0-30.0% of m/z 198 365 greater than 1.00% of m/z 198 441 present, but Less than m/z 443 442 greater than 40.0% m/z 198 443 greater than 40.0% m/z 198 443 17.0-23.0% of m/z 442	2. All XRSD must be <=30.0%

TABLE F-25. LABORATORY QUALITY CONTROL CHECK SAMPLE SUMMARY FOR ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SICUX FALLS, SOUTH DAKOTA (CONTINUED)

Parameter	Continuing Calibration Verification	Nethod Blank	ACCURACY Surrogate Recovery	Continuing Calibration ACCURACY Parameter Verification Method Blank Surrogate Recovery MS/MSD (XR) MS/MSD (RPD)	PRECISION MS/MSD (RPD)
VOLATILE ORGANIC COMPOUND (VOC'S)	Criteria: 1. RRF for TCL compounds must be >=0.05; however, RRF for SPCC compounds must be >0.3 2. All %D must be <=25%	Criteria: No contaminants should be present in the blanks.	Criteria: Sample and blank spike recoveries Spike recoveries must be within must be within a 95% confidence a 95% confidence interval which interval established through is established through repetiting analyses.	Criteria: Spike recoveries must be within e a 95% confidence interval which is established through repetitive analyses.	Criteria: RPD between HS and HSD recoveries must be within a 95% confidence interval established through repetitive analysis.
F-52				·	
SEMIVOLATILE ORGANIC Criteria: COMPOUND (SVOC'S) 1. RRF for be >=0. SPCC cc	C Criteria: 1. RRF for ICL compounds must be >=0.05; however, RRF for SPCC compounds m·st be >0.3 2. All %D must be <=25%	Criteria: No contaminants should be present in the blanks.	Criteria: Sample and blank spike recoveries Spike recoveries must be within must be within a 95% confidence a 95% confidence interval which interval established through is established through repetitive analysis.	Criteria: Spike recoveries must be within a 95% confidence interval which is established through repetitive analyses.	Criteria: RPD between MS and MSD recoveries must be within a 95% confidence interval established through repetitive analysis.

TABLE F-26. LABORATORY QUALITY CONTROL CHECK SAMPLE SUMMARY FOR MISCELLANEOUS INORGANICS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA (CONTINUED)

	`				
Parameter	Method Number	Holding Time (days)	Initial Calibration Verification	Continuing Calibration Verification	Method Blank
₹ F-5	SU 3550/EP 418.1	28 Days -Water Samples No holding times cited for soils (28 days was arbitrarily used).	Ensure that a 3-5 point curve bracketing the sample concentration is performed daily.	Not Applicable	Criteria: No contaminants should be found in the blanks.
3 201	CX S89	28 Days was used which was established on the Job Specific Document.	Not Applicable	Not Applicable	uriteria: No contaminants should be found in the blanks.
MISCELLANEOUS INGRANICS: Dissolved Arsenic Dissolved Lead Dissolved Iron Dissolved Manganese Dissolved Agolum Dissolved Agolum Dissolved Anganese Calcium Dissolved Manganese Dissolved Anganese Dissolved Manganese Dissolved Anganesium Sulfate Chloride Nitrate TDS TS TS Total Alkalinity Bicarbonate Alkalinity PH	LX WM3A/SW 7061 LX WM2/SW 7421 LX WM1B/SW 6010 LX WM1B/SW 6010 SW 7770 SW 7770 SW 7770 SW 7770 SW 7760 SW 7770	6-Months (Preserved pH<2) 8 Days 28 Days 24 Hours 7 Days 7 Days 14 Days 14 Days 14 Days 14 Days 6 Hours-Determine on Site	Not Applicable .	Not Applicable	Not Applicable

TABLE F-26. LABORATORY QUALITY CONTROL CHECK SAMPLE SUMMARY FOR MISCELLANEOUS INORGANICS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Control Limit %R should be 75-125%	Not Applicable	Not Applicable
Spike %R must be within 82-114%.	Spike %R must be within 75-125%.	Control Limits: Criteria:  No contaminants should be found As 635.0-1199.0 1. Samples used as field blanks cannot in the blanks.  Pb 188.0-285.0 be used for spiked sample anslysis.  2. Spike XR must be within 75-125% (Note: Spike recovery limits do not apply when the sample concentration exceeds the spike concentration by a factor of 4 or more.)
1	Control Limit: 3.74-5.06	Control Limits: As 635.0-1199.0 Pb 188.0-285.0
Criteria: No contaminants should be fout in the blanks.	Not Applicable	Criteria: No contaminants should be founc in the blanks.
Not Applicable	Not Applicable	%R must be >0% where applicable. (For As, Pb, Fe, t Mn, Na, Ca, Mg).
Not Applicable	Not Applicable	An ICS must be run at the "K must be >0% beginning and end of each where applicable. sample analysis run (or (for As, Pb, Fe, twice during an 8 hour shift Mn, Na, Ca, Mg) whichever is more frequent).
1PH	100	HISCELLANEOUS I NORGANICS: Un Dissolved Arsenic Dissolved Lead Dissolved Iron Dissolved Manganese Dissolved Manganese Dissolved Agnesium Sulfate Chloride Nitrate IDS ISS ISS IQS IQS IQS IQS IQS IQS IQS IQ
	Not Applicable Not Applicable Criteria: No contaminants should be found in the blanks.	Not Applicable Not Applicable Criteria:  No contaminants should be found in the blanks.  Not Applicable Not Applicable Not Applicable Spike XR must be within 75-125X.

	6) 11 11 11 11 11 11 11 11 11 11 11 11 11	
Parameter	PRECISION MS/MSD (RPD)	Duplicate Analysis
Hd1	RPD CONTROL LIMIT Soil: 13	Criteria: A control limit of 75-125% RPD is applicable.
Toc	RPD CONTROL LIMIT Soil: 30	Not Applicable
MISCELLANEOUS INORGANICS: Dissolved Arsenic Dissolved Lead Dissolved Iron Dissolved Manganese Dissolved Manganese Dissolved Manganese Dissolved Magnesium Sulfate Chloride Nitrate TOS TSS TOTAL Alkalinity Carbonate Alkalinity	RP9 CONTROL LIMITS:  WATER SOIL AS 5 Pb 7 6 Fe 23 Mn 20	No control limits have been established but RPD's were <=3.0%.

## ENDNOTES FOR TABLES F-24 TO F-26

TPH - Total Petroleum Hydrocarbons (Oils and Greases)
TOC - Total Organic Carbon
TDS - Total Dissolved Solids
TSS - Total Suspended Solids
ICS - Interference Check Sample
TCL - Target Compound List
RRF - Relative Response Factors
SPCC - System Performance Check Compound
%RSD - Percent Relative Standard Deviation
%D - Percent Difference
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification
CRDL - Contract Required Detection Limit

# TABLE F-27. LAUCKS TESTING LABORATORY METHOD SUMMARY FOR SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA

	333	
Ľ	x wm1:	A modification of method SW 3010. The volume is reduced once during digestion and diluted back up to ten times less than the starting volume. Both are HNO3 and HCl digestions.
Ľ	X WM1B:	A modification of Method SW 3005. The volume is reduced once during digestion and diluted back up to ten times less than the starting volume. Both are HNO3 and HCl digestions.
Ľ	X WM2:	A modification of Method SW 3020. The volume is reduced once during digestion with HNO3 and H202 and diluted back to starting volume.
L	X WM3 A&B:	Modifications of SM 303E. Some of the volumes of reagents vary from SM, KI is used rather than NaI and Laucks uses preserved, not digested, sample.
L	X WM4:	A modification of Method SW 7470. Some of the volumes of reagents vary from the SW method.
	X SM1 X SM2:	A modification of Method SW 3050. Laucks uses samples which have been dried at 105 degrees C rather than as-recieved samples; some of the volumes of reagents vary; and digestion times vary.
L	X SM3 A&B:	Modifications of Methods SW 7061 and SW 7741. Laucks digests the dried sample directly, rather than digesting an aliquot of a previous digest.
L	X SM4:	A modification of Method SW 7471. Laucks uses a larger sample size and some of the volumes of reagents vary.
L	X EP3:	A modification of Method SW 3010. The volume is reduced once during digestion and by a lesser amount than in SW 3010. Both are HNO3 and HCl digestions.
L	X EP4:	A modification of Method SW 7470. Some of the volumes of reagents vary from the SW method.

volumes of reagents vary from the SW method.

LX SB9: This is a method for determination of Total Organic Carbon in a soil or sediment sample, adapted from the Puget Sound Estuary Program protocols (Tetra Tech).

Note: Test results for dissolved metals derive from analyses performed on sample aliquots which filtered in the field during sampling.

TABLE F-28. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

SAIC Sample Mumber	Laboratory 10 Number	MS/MSD Results	Duplicate Sample (e)	Spiked Sample Results (f)	Laboratory Control (9)	ICP CROL Standard Initial/Final	AA CROL STANDARD	Sample Results
Mu1-4 Mu1-4 Mu1-5 Mu1-5 Mu1-7 Mu1-8 Mu1-9			,					Pb(d)3.2vg/L Pb(d)2.1vg/L Pb(d)2.0vg/L Pb(d)3.7vg/L Pb(d)1.4vg/L Pb(d)1.4vg/L Pb(d)3.2vg/L Pb(d)3.2vg/L Pb(d)3.2vg/L
HU1-11	15928-41	AS WITHIN LIMIT	LINITS RPD = /					As(d)5ug/L Pb(d)2.1ug/L As(d)6ug/L
HW1-120UP	15928-43							4e 1.2mo/kg
S01LS 81-1-15	15928-76	ALL WITHIN			Cr XR = 69.8	Be XR = 57/51		Pb 2.6mg/kg
81-1-25	15928-77	LINITS UNLESS			ALL OTHERS	cd XR = 80/95		As 1.4mg/kg Pb 3.1mg/kg
	15028-78	MOTED			X	Cr XR = 136/124	Sb XR =103	As 1.9mg/kg Pb 3.2mg/kg
<u> </u>	4¢02ft-70				LIMITS	Cu XR = 91/56	As XR = 102	As 1.8mg/kg Pb 3.1mg/kg
81-2- <i>c</i> 5	15928-80					Ni XR = 74/83	Pb 78 = 104	Pb 8.7mg/kg As 5.6mg/kg Cu 12mg/kg Be D.5mg/kg Wi 77mg/kg Cr 15mg/kg Zn 54mg/kg
83-1-5	1592(3-81					Ag XR = 87/78	11 XR = 102	Pb 13.9mg/kg As 8.9mg/kg As 8.9mg/kg Cu 22mg/kg Ni 31mg/kg Cr 29mg/kg
<b>63-2-0</b>	15928-62					Zn 38 = 124/131		Pb Bng/kg As 12mg/kg Cu 10mg/kg Be 0.4mg/kg Ni 23mg/kg Cr 15mg/kg Zn 48mg/kg

TABLE F-28. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS
AT SOUTH DAKOTA AIR NATIONAL GLARD, JOE FOSS FIELD, SIGLY FALLS, SOUTH DAKOTA (CONTINUED)

		Al SWIN DANGEN			•			
SAIC Sample Number	Laboratory 1D Number		PRECISION Duplicate Sample (e)	Spiked Sample Results (f)	LCS Laboratory Control (g)	CRDL Verification ICP CRDL Standard Initial/Final	AA CROL STANDARD	Significant Sample Results
WATERS EB-4	15928-5			0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ALL	Be XR=92/89 Cd XR=88/113		Cu(3d) Cr(2d) Zn(9d)
E8-5	15928-6				St IX	Cr XR=96/6/ Cu XR=173/117 Mn XR=62/97	AS XR=100	Pb(1.9d) Cu(4d) Cr(4d) Zn(12d) NI(4d)
F8-1	15928-10					Mn XR=62/97	Pb XR=610/118/102	Cu(2d) Zn(d)8ug/L
EB-11	15928-15	Ag RPD = 7 All OTHER ELEMENTS				Ni %=80/78	Se XR=97	Pb(1.2d) Zn(6d)
низ-1	15928-20	LITHIN LIMITS				Ag XR=89/104	Tl XR=101	Pb(11d) Se(d)6ug/L Cu(d)8ug/L N1(d)34ug/L Cr(d)2ug/L Zn(d)53ug/L
M/3-2	15928-21					Zn XR=848/120		Pb(d)5.2ug/L Cu(d)5ug/L Ni(d)15ug/L Cr(d)3ug/L Zn(d)24ug/L
MH3-20UP	15928-22					Fe XR=122/141		Pb(d) ² .0ug/L Cu(d)5ug/L Ni(d)14ug/L Cc(d)1ug/L Cr(d)3úg/L Zn(d)22ug/L

TABLE F-28. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIQUX FALLS, SOUTH DAKOTA (COMTINUED)

SAIC Sample Number	Laboratory 1D Number	ACCURACY MS/NSD Results	PRECISION Duplicate Sample (e)	Spiked Sample Results (f)	LCS Laboratory Control (9)	CRDL Verification ICP CRDL Standard Initial/Final	AA CROL Standard	Significant Sample Results
B3-5-2.5								Pb 10.1mg/kg As 5.9mg/kg Cu 12mg/kg Be 0.6mg/kg Ni 20mg/kg Cd 0.6mg/kg Cr 20mg/kg
MU1-5-15	15928-92							As 1.2mg/kg Pb 3mg/kg
M41-5-20	15928-93							As 1.3mg/kg Pb 2.6mg/kg
HW1-6-15	15928-94							As 4.8mg/kg Pb 2.8mg/kg
MW1-6-150UP	15928-95							As 7mg/kg Pb 3.2mg/kg
MW1-6-20	15928-96	Be XR = 121/120 cd XR = 126					Sb %R = 103 Pb %R = 92	As 5.7mg/kg Pb 2.2mg/kg
NV1-7-15	15928-97						ı	As 4.1mg/kg Pb 2.9mg/kg
MW1-7-20	15928-98							As 3.4mg/kg Pb 2.2mg/kg
MW1-8-15	15928-99						<b>x</b>	Aš 4.9mg/kg Pb 2.2mg/kg
MU1-8-20	15928-100							As 5.3mg/kg Pb 2.2mg/kg
MU1-9-15	15928-101	•						As 2.4mg/kg Pb 2.8mg/kg
MU1-9-20	15928-102							As 2.6mg/kg Pb 2.6mg/kg
MW1-10-15	15928-103			,				As 2.2mg/kg Pb 3.3mg/kg
MV1-10-150UP 15928-104	15928-104							As 2.2mg/kg Pb 3mg/kg
MW1-10-20	15928-105	•						As 1.6mg/kg Pb 2.5mg/kg
MU1-11-75	15928-106							As 4.4mg/kg Pb 2.6mg/kg
MU1-11-20	15928-107							As 3.8mg/kg Pb 2.4mg/kg

TABLE F-28. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA (CONTINUED)

Significant Sample Results	1	Pb 6.2mg/kg As 8.9mg/kg Cu 9mg/kg Be 0.3mg/kg Ni 23mg/kg Cr 12mg/kg Zn 46mg/kg	Pb 7.5mg/kg As 8.4mg/kg Cu 11mg/kg Be 0.3mg/kg Mi 21mg/kg Cr 12mg/kg Zn 49mg/kg	Pb 10.8mg/kg As 7mg/kg Cu 14mg/kg Be 0.7mg/kg Ni 22mg/kg Cr 20mg/kg Zn 71mg/kg	Pb 15.1mg/kg As 8.9mg/kg Cu 18mg/kg Be Img/kg Ni 25mg/kg Cr 25mg/kg Zn 87mg/kg	Pb 13.5mg/kg As 8.6mg/kg Cu 19mg/kg Be 1.1mg/kg Ni 31mg/kg Cd 0.5mg/kg Cr 27mg/kg	Pb 12:4mg/kg As 6.2mg/kg Cu 10mg/kg Be 0.4mg/kg Ni 17mg/kg Cr 16mg/kg Zn 52mg/kg
AA CRDL STANDARD				,			
CRDL Verification ICP CRDL Standard Initial/Final							·
LCS Laboratory Control (g)							
Spiked Sample Results (f)							
PRECISION Duplicate Sample (e)							
ACCURACY FY MS/MSD Results							
Laboratory 10 Number	15928-83	15928-84 15928-85	15928-86	15928-87	15928-88	15928-89	15928-90
SAIC Sample Number		83-2-5 83-3-00up	83-3-00UP	83-3-2.5	6-7-18	B3-4-5	B3-5-0

TABLE F-28. LABORATORY GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA (CONTINUED)
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ACCHBACY
ACCHBACY

Leboratory (D Number	ACCURACY MS/MSD Results	PRECISION Duplicate Sample (e)	Spiked Sample Results (f)	LCS Laboratory Control (9)	CRDL Verification ICP CRDL Standard Initial/Final	AA CRDL STAYDARO	Significant Sample Results
							Pb(d)16ug/L As(d)30ug/L Se(d)5ug/L Cu(d)16ug/L Cu(d)1ug/L Ci(d)1ug/L Zu(d)4ug/L
							Pb(d)8,5ug/L As(d)8ug/L Se(d)5ug/L Cu(d)10ug/L KI(d)20ug/L Cr(d)6ug/L Zn(d)36ug/L
							Pb(d)13vg/L As(d)6vg/L Se(d)7vg/L Cu(d)13vg/L KI(d25vg/L Cr(d)7vg/L
							Pb(d)1.4vg/L Cu(d)3vg/L Zn(d)14vg/L
							Pb(d)1.9ug/L Zn(d)5ug/L
	SS WITHIN LIMITS RPD = 16	RPD # 16					Pb(d)2.6vg/L Zn(d)5vg/L
				ALL WITHIN LIMITS		As XR=100 Pb XR=610/118/102	Pb(d)1.5ug/L Pb(d)1.1ug/L Pb(d)2.5ug/L Pb(d)9.7ug/L Pb(d)1.4ug/L
	Fe OUIS:DE LIMITS, MO WITHIM LIMITS	Fe RPD = 31 Mn RPD = 20	Mn XR=128 All Other Elements Vithin Limits				Fe(d)37ug/L Mn(d)2100ug/L Na(d)12mg/L Ca(d)83mg/L Mg(d)17mg/L
	AS WITHIN LIMITS RPD	. RPO = 5		ALL VITHIN LIMITS		As XR=100 Pb XR=610/118/102	Pb(d)2ug/L Pb(d)1ug/L Pb(d)1.7ug/L
	Pb WITHIN LIMITS P.CD = 7	F = 0.5		ALL WITHIN LIMITS		As XR=100 Fb XR=610/118/102	Pb(d)2.2ug/L Fe(d)5600ug/L Mn(d)2000ug/L Na(d)21mg/L

TABLE F-28. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS AT SOUTH DAKOTA AIR NATIOWAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA (CONTINUED)

	Significant Sample Results	As 2.8mg/kg	As 2.8mg/kg Pb 2.8mg/kg	As 5.2mg/kg Pb 2.3mg/kg	As 1.2mg/kg Pb 2.4mg/kg	As 1mg/kg Pb 2mg/kg	As 21mg/kg Pb 7.1mg/kg	As 3.3mg/kg Pb 2.1mg/kg	Pb 2.8mg/kg As 2.2mg/kg Cu 5mg/kg Ni 22mg/kg Cr 8mg/kg Zn 20mg/kg	Pb 2.4mg/kg As 1.8mg/kg Cu 3mg/kg Ni 14mg/kg Cr 9mg/kg Zn 17mg/kg	Pb 3.1mg/kg As 1.8mg/kg Cu 2mg/kg Ni 12mg/kg Cr 6mg/kg Zr 18mg/kg	Pb 11mg/kg As 6.4mg/kg Se 0.6mg/kg Cu 13mg/kg Be 0.6mg/kg Cd 0.5mg/kg Cd 0.5mg/kg Cr 22mg/kg
	AA CRCL											
	CRDL Verification ICP CRDL Standard							•				
11510, 3100A 11	LCS Laboratory	(A) to this										
GUARD, JUE FUSS FIELD, STOCK CALLS	Spiked Sample	Results (1)										
¥	PRECISION Duplicate	Sample (e)										
AT SOUTH DAKOT		Kesults										
	Laboratory 10	Number 15928-108	15928-109	15928-110	15928-111	15928-112	15928-113	15928-114	15928-115	15928-116	15928-117	15928-118
	a) di	Number  MW1-12-15	MW1-12-15	MU1-12-20	MW1-13-15	MU1-13-20	HW1-14-15	MW1-14-20	BK-2-15	BK-2-20	BK-2-25	BK3-0.5

TABLE F-28. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SICCY FALLS, SOUTH DAKOTA (CONTINUED)

Significant Sample Results	Pb 7.2mg/kg As 5.4mg/kg Cu 6mg/kg Be 0.3mg/kg Ni 18mg/kg Cr 10mg/kg Zn 35mg/kg	Pb 2.5mg/kg As 3.5mg/kg Cu 4mg/kg Ni 15mg/kg Cr 11mg/kg 2n 25mg/kg	As, Pb-ND As, Pb-ND As, Pb-ND As, Pb-ND As, Pb-ND Pb 1, 1ug/L As, Pb-ND As,	As, Pb-ND As, Pb-ND As, Pb-ND As, Pb-ND As, Pb-ND
AA CRDL STANDARD		Sb XR = 105 Pb XR = 96 Tl XR = 101		
CRDL Verification ICP CRDL tandard		,	NO ICP ANALYSES CONDUCTED	
LCS Laboratory Control (9)			ALL WITHIN LIMITS	
Spiked Sample Results (f)			SEE SAHPLE NUMBERS 17709-04 AND N17709-05	
PRECISION Duplicate Sample (e)		,,	SEE SAHP NUMBERS NUTHIN LIMIPD RPD =15 17709-04 NITHIN LIMIAS RPD WITHIN17709-05	
ACCURACY HS/MSD Results		Pb XR = 138.4 . Be XR = 119/117 Pb RPD=24	PD XR WITHIN LIMIPD As XR WITHIN LIMIAS	
Laboratory 10 Number	15928-119	15928-120	17709-02 17709-03 17709-05 17709-05 17709-06 17709-08 17709-10 17709-11 17709-12 17709-13 17709-13	17709-16 17709-17 17709-18 17709-19
SAIC Sample Number	BK3-5	BK3-20	. FB-3 EB-15 GW1-1 GW1-4 GW1-6 GW1-7 GW1-10 GW1-10	6xt-13 6xt-14 5x-1 5x-2 5x-3

TABLE F-28. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR NETALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SQUTH DAKOTA (CONTINUED)

	ug/l
90-120 percent	d detection limits: L
limits: S	t required
) Control	) Contraci
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soil	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000
water	20 20 20 20 20 20 20 20 20 20 20 20 20 2
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(c) Control limit: 80-120 percent for all elements.
(d) Control limits: 75-125 percent.
(e) Control limits: RPO-20x(water),<35x(soil)
(g) Control limits: 80-120 percent for all elements except Ag and Sb (water) soil
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AL 66.2-130.5
Sb 60.2-130.8
AS 60.2-130.8
BB 0.0-2130.8
BB 60.2-130.8
BB 65.1-14.9
CG 78.5-120.5
CG 86.3-112.5
CG 86.3-112.5
CG 86.3-112.5
FE 79.2-120.7
PD 77.7-120.8
PM 85.1-114.9
PM 85.1-114.9
PM 85.1-114.9
PM 85.1-114.9
PM 86.9-133.9
N 80.8-119.2
K 0.0-2000.0
Se 48.7-150.5
N 9 65.8-150.6
N 9 0.0-2000.0
T 1 6.7-131.4
V 78.6-121.4

(h)CRDL Verification no contract required control limits. Any recovery greater than zero is deemed unacceptable.

TABLE F-29. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA

	,		: :		CALIBRATION		BLANKS (CRDL's for water used)	r water used)	S01/401	ICS
SAIC Sample Number	Laboratory 10 Number	Sample Collection Date	Holding Time Evaluation	Initial Calibration (a)	Continuing Calibration (a)	Initial Blank (b)	Continuing Rlank (b)	Procedural* Blank (b)	Initial (	Initial (c) Final (c)
WATERS ER-4	15928-5	04-14-89	Hg-34 DAYS ALL OTHERS OK	JEB LIST ALL AUTHIN	IFB LIST ALL VITHIN	NO INTERFERENTS	NO INTERFERENTS	2n = 5ug/L NO OTHER INTERFERIS	ALL WITHIN LIMITS	ALL WITHIN LIMITS
E8-5	15928-6	04-15-89	Hg-34 DAYS ALL OTHERS OK							
							×			
F8-1	15928-10	04-19-89	Hg-32 DAYS ALL OTHERS OK				•			
EB-11	15928-15	04-28-89	ארר סא							
MU3-1	15928-20	05-01-89	אור סג							
				,						
M43-2	15928-21	05-01-89	ALL OK							

M43-20UP 15928-22 05-01-89 ALL 0K

TABLE F-29. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA (CONTINUED)

SAIC Sample	Leboratory 10	Sample Collection	Holding Time	Initial Calibration (a)	CALIBRATION Continuing Calibration (a)	Initial Black (b)	BLANKS (CROL's for water used) Continuing Procedural* Blank (b) Blank (b)	Procedural* Blank (b)	ICP/ICS Initial (c) Final (c)
BK-2-25	15928-117	04-28-89	אור סג						
8K3-0.5	15928-118	04-28-89	און סא						
BK3-5	15928-119	04-25-89	אור סג						
BK3-20	159213-120	04-28-89	אור סע						
88-8 88-15-16-15-16-15-16-15-16-16-16-16-16-16-16-16-16-16-16-16-16-	17709-02 17709-03 17709-03 17709-06 17709-06 17709-09 17709-11 17709-13 17709-13	07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89	22222222222222222222222222222222222222	ALL WITHIN LIMITS	ALL VITHIN VITHIN	MO INTERFERENTS DETECTED	MO INTERFERENTS DETECTED	MO INTERFERENTS DETECTED	NO 1CS ANALTSES CONDUCTED
641-12 641-13 641-14 S4-1 S4-2	17709-16 17709-18 17709-19 17709-19	07-25-89 07-25-89 07-26-89 07-26-89	\$ 8888 <b>8</b>						

TABLE F-29. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

SAIC Sample Number	Laboratory 10 Number	Sample Collection Date	Holding Time Evaluation	Initial Calibration (a)	CALIBRATION Continuing Calibration (a)	Initial Blank (b)	BLANKS (CRDL's for water used) Continuing Procedural* Blank (b) Blank (b)	or water used) Procedural* Blank (b)	ICP/ICS Initial (c) Final (c)
83-4-5		-89	ALL OK					1 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
					٠				
83-5-0	15928-90	04-15-89	ALL OK						
83-5-2.5	15928-91	04-15-89	ALL OK				,		
M11-5-15	15928-92	04-16-89	ארר סע						
MU1-5-20	15928-93	04-16-89	ALL OK					,	
MU1-6-15	15928-94	04-16-89	ALL OK						
MU1-6-150UP	15928-95	04-16-89	ALL OK						
MU1-6-20	15928-96	04-16-89	ALL OK						
HW1-7-15	15928-97	04-17-89	ALL OK						
MU1-7-20	15928-98	04-17-89	ALL OK						
MU1-8-15	15928-99	04-17-89	אור פע						
MW1-8-20	15928-100	04-17-89	און פע						
HU1-9-15	15928-101	04-25-89	ALL OK						

TABLE F-29. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

SAIC Sample Number	Laboratory 10 Nurber	Sample Collection Date	Holding Time Evaluation	C Initial Calibration (a)	CALIBRATION Continuing Calibration (a)	Initial Blank (b)	BLAHKS (CRDL's for water used) Continuing Procedural* Blank (b) Blank (b)	Procedural*	ICP/ICS Initial (c) Final (c)
	15928-23	ο.	ALL OK						
MU3-4	15928-24	05-02-89	ALL OK						
						,			
MW3-5	15928-25	05-01-89	ALL OK						
EB-13	15928-27	05-01-89	ALL OK						
EB-14	15928-28	05-02-89	ALL OK	`				**	
F8-2	15928-29	04-30-89	ALL OK						
E8-7 E8-8 E8-9	15928-8 15928-11 15928-12	04-17-89 04-25-89 04-26-89	ALL OK ALL OK ALL OK	Pb As ORLY ALL WITHIN	Pb As ONLY ALL WITHIN	NO INTERFERENTS	NO INTERFERENTS	NO INTERFERENTS	NOT ANALYZED
EB-10 MU1-13 MU1-14 EB-12 MU1-1	15928-14 15928-18 15928-19 15928-26 15928-31	04-27-89 04-30-89 04-30-89 04-30-89	ALL OK ALL OK ALL OK ALL OK ALL OK	STIMITS	S H H H				
E8-1 E8-6	15928-1 15928-3 15928-7	04-11-89 04-13-89 04-16-89	ALL 0K ALL 0K ALL 0K	ALL (AS,Pb ONLY) WITHIN LIMITS	ALL (As,Pb ONLY) WITHIN LIMITS	NO ' INTERFERENTS	NO INTERFERENTS	NO INTERFERENTS	NOT ANALYZED
HU1-1	.15928-31	04-30-89	ALL OK	ALL WITHIN LIMITS	ALL WITHIN	NO INTERFERENTS	NG INTERFERENTS	NO INTERFERENTS	NOT Analyzed

TABLE F-29. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIQUX FALLS, SOUTH DAKOTA (CONTINUED)

		1		J	CALIBRATION		BLANKS (CRDL's for water used)	or water used)	1CP/1CS
SAIC Sample Number			Time Evaluation	Initial Calibration (a)	Continuing Calibration (a)	Initial Blank (b)	Continuing Blank (b)	Procedural* Blank (b)	Initial (c) Final (c)
MW1-9-20	15928-102	04-25-89	ALL OK						
MW1-10-15	15928-103	04-26-89	ALL OK						
MW1-10-150UP 15928-104	15928-104	04-56-89	ALL OK						
MW1-10-20	15928-105	04-56-89	ALL OK						
MW1-11-15	15928-106	04-26-89	ALL OK			×			
MW1-11-20	15928-107	04-56-89	ALL OK						
MW1-12-15	15928-108	04-27-89	ALL OK						
MW1-12-150UP	15928-109	04-56-89	ALL OK						
MW1-12-29	15928-110	04-27-89	ALL OK						
HW1-13-15	15928-111	04-27-89	ארר סג						
MV1-13-20	15928-112	04-27-89	ALL OK						
MU1-14-15	15928-113	04-28-89	ALL OK						
MV1-14-20	15928-114	04-28-89	ALL OK						
BK-2-15	15928-115	04-28-89	ALL OK						

ALL OK

04-28-89

15928-116

BK-2-20

TABLE F-29. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS AT SOUTH DAKOTA AIR MATIONAL GUARD, JOE FOSS FIELD, SIQUX FALLS, SOUTH DAKOTA (COMTINUED)

	•			U	CALIBRATION		BLANKS (CRDL's for water used)	r water used)	ICP/ICS	S
SAIC Sample Number	Laboratory 10 Number	Sample Collection Date	Holding Time Evaluation	Initial Calibration (a)	Continuing Calibration (a)	Initial Blank (b)	Continuing Blank (b)	Procedural* Blank (b)	Initial (c	Initial (c) Final (c)
HU1-3	15928-32	04-30-89	ALL OK	LIMITS (AS, Pb ONLY)	LINITS (AS,Pb ONLY) LINITS (AS,Pb ONLY)	INTERFERENTS	INTERFERENTS	INTERFERENTS	ANALYZED	
Mu1-4 Mu1-40UP	15928-33 15928-34	04-30-89	88	ALL (As,Pb Only) WITHIN	ALL WITHIN LIMITS					
#11-5 #11-6	15928-35 15926-36 15928-37	04-30-89 04-30-89 04-30-89	888	riikiis						
8-17-18 8-17-10	15928-38 15928-39 15928-40	04-30-89	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6							
HW1-12	15928-42	04-30-89								
MW1-120UP	15928-43	04-30-89	ALL OK							
SOILS B1-1-15	15928-76	04-11-89	ALL OK	Se XR = 84	Se %R = 84/91		ALL WITHIN LIMITS		ALL	Ag XR = 123
81-1-25	15928-77	04-11-89	ALL OK	ALL OTHER	, ALL OTHER			·	VITHIN	ALL OTHERS
81-2-15	15928-78	04-13-89	ALL OK	PP Met List	PP Wet List				LIMITS	WITHIN
81-2-25	15928-79	04-13-89	ALL OK	WITHIN LIMITS	WITHIN LIMITS					LIMITS
83-1-0	15928-80	04-14-89	ALL OK			1	1 1 1 0 1 1 0 1 0 1 1 1 1 1 1 1 1 1 1 1			

TABLE F-29. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR METALS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

SAIC Sample Number	Laboratory 10 Number	Sample Collection Date	Holding Time Evaluation	C Initial Calibration (a)	CALIBRATION Continuing Calibration (a)	Initial Blank (b)	BLANKS (CRDL's for water used) Continuing Procedural* Blank (b)	or water used) Procedural* Blank (b)	ICP/ICS Initial (c) Final (c)
83-1-5	15928-81	04-14-89	ALL OK						
83-2-0	15928-82	04-14-89	אור סע						
83-2-00UP	15928-83	04-14-89	אור סע						
83-2-5 83-3-00UP	15928-84 15928-85	04-14-89 04-14-89	אר פע ארן פע						
83-3-00UP	15928-86	04-14-89	און פע						
83-3-2.5	15928-87	04-14-89	אור סע						
83-4-0	15928-88	04-15-89	ALL OK						

TABLE F-30. LABORATORY QUALITY CONTROL SAMPLE RESULTS FOR VOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Volatile Blank Analyses	NO CONTANINANTS DETECTED	NO CONTAMINANTS DETECTED	NO CONTAHINANTS DETECTED	NO CONTAMINANTS DETECTED
Continuing Calibration Check	0420V2J1 ALL RRF50, XD VALUES WITHIN LIMITS	0421V2J1 2BUT, t13DCPe, 2HEX <.300 ALL OTHER RRF5O, 2D VALUES WITHIN LIMITS	0428V2J2 28U1,t13DCPe,2HEX RRF50<.300 ALL OTHER RRF50, %D VALUES WITHIN LIMITS	OSO3V2S1 ACETONE, 2BUT, TCE, MIPK, 2HEX, PCE RRF50<-300 CHLOROMETHANE, CSC, CCL4, PCA, XD=:>25 ALL OTHER RRF50 XD VALUES WITHIN LIMITS
Initial Calibration Check	DAILY TUNE IN CONTROL 04-19-89 ALL XRSD VALUES WITHIN LIMITS 28UT, t3DCPe, 2HEX <.3 ALL OTHER RRF VALUES WITHIH	04-19-89 ALL XRSD VALUES WITHIN LIMITS 28UT, t130CPe, 2HEX <-3 ALL OTHER RRF VALUES WITHIN LIMITS	04-19-89 ALL XRSD VALUES WITHIN LIMITS 28UT, t130CPe, 2HEX <.3 ALL OTHER RRF VALUES WITHIN	04-25-89 ALL CCC/SPCC CRITERIA MET ALL %RSD VALUES <30.
Volatile Tuning/Mass Calibration	ALL CRITERIA IN CONTROL	ALL CRITERIA IN CONTROL	ALL CRITERIA IN CONTROL	ALL CRITERIA IN CONTROL
	04-20-89 04-20-89 04-20-89 04-20-89	04-21-89 04-21-89 04-21-89 04-21-89 04-21-89 04-21-89 04-21-89 04-21-89	04-28-89 04-28-89 04-28-89 04-28-89	05-03-89 05-03-89 05-03-89 05-03-89 05-03-89 05-03-89 05-03-89 05-03-89 05-03-89 05-03-89 05-03-89
Sample Collection Date	မှု ထုံထုံထုံ	04-19-89 04-14-89 04-17-89 04-16-89 04-15-89 04-13-89 04-17-89	04-25-89 04-25-89 04-25-89	04-27-89 04-28-89 04-27-89 04-30-89 04-30-89 05-01-89 05-01-89 05-02-89
Laboratory Identification Number	во420мумы 15928-01 15928-02 15928-03	B0421MV04J1 15928-10 15928-08 15928-08 15928-07 15928-05 15928-08 15928-084 15928-0845	В0428муомJ1 15928-11 15928-12 15928-13	80503MVOMS1 15928-14 15928-16 15928-16 15928-17 15928-17 15928-21 15928-22 15928-23 15928-24
SAIC Sample Number	METHOD BLANK (WATERS) EB-1 TB-1 EB-3	METHOO BLANK (WATERS) FB-1 1B-3 EB-7 EB-6 EB-5 EB-7 EB-7MS EB-7MS	METHOD BLANK (WATERS) EB-8 EB-9 TB-4	HETHOO BLANK (UATERS) EB-10 EB-11 TB-5 HU1-13 TB-6 HU1-14 MU3-1 MU3-2 MU3-3 MU3-3 MU3-3 MU3-5

	Volatile Blank Analyses	CH2CL2=1ug/L ALL OTKERS UNDETECTED	NO CONTAMINANTS DETECTED	NO CONTAMINANTS DETECTED	
(IC COMPOUNDS (CONTINUED)	Continuing Calibration Check	0504V2S2 1121CA,2HEX,2BUT, MIPK,ACETONE RRF50<.3 CHLOROMETHANE BROMOMETHANE CHLOROETHANE CS2,120CE,2BUT, PCA XD>25 ALL OTHER RRF50 XD VALUES WITHIN LIMITS	0508V2S2 ACETONE, 28UT, 112TCA, MIPK, 2HEX RRF50<-300 CHLOROSTHANE, CS2, 12DCE, XD>25 ALL OTHER RRF50, XD VALUES WITHIN LIMITS	0509V2S2 ACETONE, 2BUT, 12DCP, HIPK, 2HEX RRF50 < .300 CHLOROETHANE, CS2, 12DCE, TC2, XYLENE XD>25	0420V2S1 2BUT, 2HEX RRF50 < 3300 CHCOROETHANE, CS2, 120CA, 2BUT, 1111CA, CCL4, VCE, BOCH, c130CPC, RE, 2DCM, t130CPC, RE, 2DCM, LIMITS
E F-30. LABORATORY QUALITY CONTROL CHECK SAMFLE RESULTS FOR VOLATILE ORGANIC COMPOUNDS SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)	Initial Calibration Check				
JL CHECK SAMPLE RESUL JOE FOSS FIELD, SIOU	Volatile Tuning/Nass Celibration	ALL CRITERIA IN CONTROL	ALL CRITERIA IN CONTROL	ALL CRITERIA IN CONTROL	ALL CRITERIA IN CONTROL
ALITY CONTRO MAL GUARD,	Sample Analysis Date(s)	05-04-89 05-04-89 05-04-89 05-04-89 05-04-89	05-08-89 05-08-89 05-08-89 05-08-89 05-08-89 05-08-89 05-08-89	05-09-89 05-09-89 05-09-89 05-09-89 05-09-89 05-09-89 05-09-89	04-20-89 04-20-89 04-20-89 04-20-89 04-20-89 04-20-89 04-20-89
BORATORY OU! FA AIR NATIO	Sample Collection Date	04-30-89 05-01-89 05-02-89 04-30-89	04-30-89 04-30-89 04-30-89 04-30-89 04-30-89 04-30-89 04-30-89 04-30-89 04-30-89 04-30-89 04-30-89 04-30-89	04-30-89 04-30-89 04-30-89 04-30-89 04-30-89 04-30-89 04-30-89	04-11-89 04-11-89 04-14-89 04-14-89 04-14-89 04-14-89 04-14-89
TABLE F-30. LA AT SOUTH DAKO	Laboratory Identification Number	80504KVOMS1 15928-26 15928-27 15928-29 15928-29	805084VOAS1 15928-37 15928-35 15928-34 15928-33 15928-31 15928-31 15928-36 15928-36 15928-36	80509WVOWS1 15928-40 15928-41 15928-41 15928-42 15928-43 15928-44 15928-404S	B0420MV0SS1 15928-77 15928-80 15928-80 15928-83 15928-83 15928-83MSD 15928-83
	SAIC Sample Number	METHOD BLANK (WATERS) EB-12 EB-14 FB-2	METHOD BLANK (WATER) MN1-6 MN1-5 MN1-4DUP MN1-4 MN1-3 MN1-1 TR-7 MN1-8 MN1-8 MN1-5NS	METHOD BLANK (WATERS) M41-9 M41-10 M41-12 M41-12DL M41-12DUP 18-8 M41-10MSD	METHOD BLANK (SOILS) 81-1-25 81-1-15 83-1-0 83-2-00UP 83-2-0MS0 83-2-0MS0 83-2-5 83-1-5

TABLE F-30. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR VOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

ļ	, (X) , (A)	(X)		
Volatile Blenk Analyses	NO CONTAMINANTS DETECTED (DL 100X)	NO CONTANTNANTS DETECTED(DL100X)	NO CONTAHINANTS DETECTED	NO CONTAMINANTS DETECTED
Continuing Calibration Check	D420V2S1 2BU1, ZHEX RRF50 <.300 CHLCRGETHANE, CS2,12CA,2BU1, 111TCA,CCL4, VACE,BOCH, c130CPe,TCE,DBCM, t130CPe,BTB XD>25 ALL OTHER RRF50 XD VALUES WITHIN LIMITS	0421V2S1 2BUT, ZHEK RRF50<300 CHLOROMETHANE, CHLOROETHANE, HECLC, CSZ, 120CA, 111TCA, CCL4, VACE, TCE, BENZENE, t130CP, 878 XD>25 ALL OTHER RRF50 XD VALUES WITHIN LIMITS	0421V2S1 2BUJ, ZHEX RRF50<.300 CHLOROMETHANE, CHLOROFTHANE, HECLE, GSZ, 120CA, 1111CA, CCL4, VACE, 1CE, BENZENE, t130CPe, BFB XD>25 ALL OTHER RRF50 XD VALUES WITHIN LINITS	04240252 28U1, 2HEX RRF50<.3 CS2, CCL4, 8DCH, TCE, DBCM, 1130CPe, 2HEX, PCE, 20>25 ALL OTHER RRF50 20 VALUES WITHIN LIMITS
Initial Calibration Check		-		•
Volatile Tuning/Mass Calibration	ALL CRITERIA IN CONTROL	ALL CRITERIA IN CONTROL	ALL CRITERIA IN CONTROL	ALL CRITERIA IN COMIROL
Sample Analysis Date(s)	04-20-89 04-20-89 04-20-89 04-20-89	04-21-89 04-21-89 04-21-89 04-21-89 04-21-89	04-21-89 04-21-89 04-21-89 04-21-89 04-21-89 04-21-89	04-24-89 04-24-89 04-24-89 04-24-89 04-24-89 04-24-89 04-24-89 04-24-89 04-24-89 04-24-89 04-24-89 04-24-89 04-24-89 04-24-89
Sample Collection Date	04-13-89 04-13-89 04-14-89	04-14-89 04-14-89 04-14-89 04-14-89 04-14-89	04-15-89 04-15-89 04-15-89 04-16-89 04-16-89 04-16-89	04-16-89 04-16-89 04-17-89 04-17-89 04-17-89 04-17-89
Laboratory Identification Number	80420MVOSS2 15928-78 15928-79 15928-85	80421W0SS2 15928-87 15928-870L 15928-86 15928-864S 15928-864S	80421NVOSS1 15928-91 15928-90 15928-89 15928-93 15928-92	80424нV0SS1 15928-95 15928-96 15928-98 15928-9845 15928-9845 15928-9845 15928-100
SAIC Semple Number	METHOD BLANK (SOILS) 81-2-15 81-2-25 83-3-00UP	METHOD BLANK (SOELS) 83-3-2.5 83-3-2.5DL 83-3-00UP 83-3-0MS . 83-3-0MS	METHOD BLANK (SOILS) B3-5-2.5 B3-5-0 B3-4-5 B3-4-0 MN1-5-15 MN1-5-15	METHOD BLANK (SOILS) MAI-6-150UP MAI-6-20 MAI-7-15 MAI-7-20 MAI-7-20HSD MAI-8-20 HAI-8-15

TABLE F-30. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR VOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIOWAL GUARD, JOE FOSS FIELD, SIQUX FALLS, SOUTH DAKOTA (CONTINUED)

Volatile Blank Analyses	NO CONTAMINANTS DETECTED	NO CONTAMINANTS DETECTED(DL100X)	NO CONTAMINANTS DETECTED	NO CONTAMINANTS DETECTED	NO CONTANTNANTS DETECTED
Continuing Calibration	042772J1 28UT,112TCA, t130CPe,2HEX RRF50<.3 28UT,8DCM,C130CPe,2DS-25 ALL OTHER RRF50 20 VALUES WITHIN	0509V2J1 2BUI,2HEX RRF50<.3 CS2,12DCE, c13DCPe,BENZENE PCA XD>25 ALL OTHER RRF50 XD VALUES WITHIN LIMITS	0508V2J1 2BUT, 2HEX RRF50c.3 CS2, 12DCE, ICE, BENZENE XD>25 ALL OTHER RRF50 XD VALUES WITHIN LIMITS	05090V2J1 2BUT, ZHEX RRF50<.3 CS2, 12DCE, c13DCPe, BENZEME, PCA XD>25 ALL OTHER RRF50 XD VALUES WITHIN LIMITS	
Initial Calibration					
Volatile Tuning/Mass	ALL CRITERIA IN CONTROL	ALL CRITERIA IN CONTROL	ALL CRITERIA IN CONTROL	ALL CRITERIA IN CONTROL	ALL Criteria Met
	04-27-89 04-27-89 04-27-89 04-27-89 04-27-89 04-27-89	05-09-89 05-09-89	05-08-89 05-08-89 05-08-89 05-08-89 05-08-89 05-08-89 05-08-89	05-09-89 05-09-89 05-09-89 05-09-89 05-09-89 05-09-89	08-02-89 08-02-89 08-02-89 08-02-89 08-02-89 08-02-89 08-02-89 08-02-89
Sample Collection	04.25-89 04.25-89 04.26-89 04.26-89 04.26-89 04.26-89	04-27-89 04-27-89	04-27-89 04-28-89 04-28-89 04-28-89 04-28-89 04-28-89	04-28-89 04-28-89 04-28-89 04-28-89 04-88-89	07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-26-89 07-26-89
Laboratory Identification	Number 804274V0SJ1 15928-101 15928-103 15928-104 15928-106 15928-106	80509WV0SJ2 15928-109 15928-108	B0508WV0SJ1 15928-110 15928-111 15928-113 15928-114 15928-115 15928-116	80509W05J1 15928-117 15928-118 15928-119 15928-120 15928-117MS	808024VO4J1 8907065-01 8907065-02 8907065-03 8907065-04 8907065-05 8907065-13 8907065-194S
SAIC Semple	METHOD BLANK (SOLES) M41-9-20 M41-10-15 M41-10-15 M41-10-15 M41-11-15 M41-11-20	METHOD BLANK (SOLLS) Mut-12-15DUP Mut-12-15	METHOD BLANK (SOILS) MAI-12-20 MAI-13-15 MAI-14-15 MAI-14-20 MAI-14-20 BK-2-15 BK-2-20 BK-2-20	METHOD BLANK (SOILS) BK2-25 BK3-0.5 BK3-50 BK3-20 BK3-20 BK2-25MS	HETHOD BLANK 18-9 FB-3 EB-15 GM1-1 GM1-4 GM1-4 GM1-4 GM1-100 SW-2 SW-2 SW-2 SW-2

TABLE F-30. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR VOLATILE ORGANIC CCHPCUNDS AT SOUTH DAXOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CCHTIMUED)

Volatile Blank Analyses	HO CONTANTANTS DETECTED	NO CONTAMINANTS DETECTED
Continuing Calibration Check		
Initial Calibration Check		
Volatile Tuning/Hass Calibration	ALL CRITERIA MET	ALL Criteria Met
Sample Analysis Date(s)	08-02-89 08-02-89 08-02-89 08-02-89 08-02-89 08-02-89 08-02-89	08-04-89 08-04-89 08-04-89 08-02-89
Sample Collection Date	08-02-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89 07-25-89	07-25-89 07-25-89 07-25-89
	80802MV0MS1 8907065-12 8907065-14 8907065-14 8907065-15 8907065-15 8907065-17 8907065-18	ВОЗО4НV0ИJ2 8097065-07 8907065-08 8907065-11
Semple	METHOD BLANK GM1-6 GM1-10 GM1-12 GM1-12 GM1-13 GM1-14 SW-1	HETHOO BLANK GUT-4D GUT-5 GUT-8

Control Limits for Water VOA Surrogate Recoveries
d8-Toluene: 88-110
Bromofluorobenzune: 86-115
d4-1,2-Dichloroethane: 76-114
Control Limits for Soil VOA Surrogate Recoveries
d8-Toluene: 81-117
Bromofluorobenzune: 74-121
d4-1,2-Dichloroethane: 70-121

Control Limits for Water VOA MS/MSD Percent Recoveries 1,1-Dichloroethene: 61-165, XRPD= 14 
Trichloroethene: 71-120, XRPD=14 
Benzene: 76-127, XRPD=11 
Toluene: 76-127, XRPD=13 
Chlorobenzene: 75-130, XRPD=13 
Chlorobenzene: 75-130, XRPD=13 
Trichloroethene: 59-172, XRPD= 22 
Trichloroethene: 69-137, XRPD= 24 
Benzene: 66-142, XRPD= 21 
Toluene: 59-139, XRPD= 21 
Chlorobenzene: 60-133, XRPD= 21

TABLE F-31. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR VOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Tentatively Identified Compounds	None Detected None Detected None Detected None Detected Total=580vg/L Total=530vg/L Total=540vg/L Hone Detected None Detected Total=610vg/L	None D.:.red None Detected Total=35ug/L Total=88ug/L Total=180ug/L Total=340ug/L Total=66ug/L None Detected	None Detected Total=1100ug/Kg Total=5800ug/Kg Total=680ug/Kg None Detected None Detected None Detected	None Detected Total=470000ug/Kg Total=180000ug/Kg Total=18000ug/Kg	None De'ected Total=30000ug/Kg Total=40000ug/Kg Total=40000ug/Kg
Significant Sample Results	ALL ND AL	Ail ND All ND ETHB=170/XYL=840ug/L ETHB=160/XY=1100ug/L ETHB=32/XYL=220ug/L	ACE=79ug/Kg XYL=150ug/Kg XYL=53ug/Kg ALL ND ALL ND ALL ND ACE=220/TOL=1100/XYL=1600	XYL=2200ug/Kg ETHB=920/XYL=14000ug/Kg ETHB=2700/XYL=5400ug/Kg	ETHB=40000/XYL=70000ug/Kg ETHB=33000/XYL=60000ug/Kg ETHB=17000/ToL=17000ug/Kg
אַאַס	ZZZZZZZZZZZZ	******	******	¥¥¥	***
Equipment Wash Analyses	*******				
	NA N	NA NA NA NA NA NA NA	<b>*</b> * * * * * * * * * * * * * * * * * *	4 4 4 2 7 2	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
@ > ~	ALL WITHIN	ALL WITHIN LIMITS	ALL WITHIN LIMITS		ALL WITHIN LIMITS
Volatile Surrogate Recovery	ATL WITHIN WITHIN	ALL LIMITS	ALL Vithin Limits	ALL VITHIN LIMITS	ALL WITHIN LIMITS
	80508MVOMS1 15928-37 15928-35 15928-35 15928-34 15928-33 15928-32 15928-31 15928-31 15928-38 15928-35MS	B0509MVOMS1 15928-39 15928-40 15928-42 15928-42 15928-43 15928-43 15928-44 15928-40MS	804204V0SS1 15928-77 15928-76 15928-80 15928-82 15928-83 15928-83MSD 15928-84	80420MV0SS2 15928-78 15928-79 15928-85	B0421HV0SS2 15928-87 15928-87DL 15928-86 15928-86MS
SAIC Sample Number	METHOD BLANK (WATER) MU1-7 MU1-6 MU1-6 MU1-4 MU1-4 MU1-1 MU1-1 MU1-1 MU1-8 MU1-8 MU1-5MS	METHOD BLANK (WATERS) MA1-9 MA1-10 MA1-11 MA1-12DL MA1-12DL MA1-12DUP TB-8 MA1-10MS MA1-10MS	METHOD BLANK (SOILS) 31-1-25 81-1-15 83-1-0 83-2-000P 83-2-0NSD 83-2-0NSD 83-2-5 83-2-5	METHOO BLANK (SOILS) B1-2-15 B1-2-25 B3-3-0DUP	METHOD BLANK (SOILS) B3-3-2.5 B3-3-2.50L B3-3-00UP B3-3-0MS

TABLE F-31. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR VOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Tentatively Identified Compounds	None Detected None Detected None Detected None Detected	None Detected None Detected None Detected None Detected Total=90g/L None Detected None Detected	None Detected None Detected None Detected None Detected	None Detected Total=809/L None Detected Total=809/L Total=8209/L Total=8209/L Total=8209/L	None Detected Total=96ug/L Total=43ug/L Total=17ug/L None Detected
Significant Sample Results					
field Blank Analyses	* * * * *	P R X X X X X X X X X X X X X X X X X X X	Z Z Z	*******	NA HA NA MEC 12=28
nt s	MeCL2=4/T0L=2 NA MeCL2=4/ACE=13/T0L=2	NA NA MEC12=4 MEC12=4/ACE=10/TOL=3 MEC12=4/ACE=16 MEC2=5/ACE=18 NA NA	ALL ND ACE=20 NA	HEC12=2 HEC12=3/10L=2 NA NA NA NA NA NA NA NA NA	MeC12=28 MeC12=28 MeC12=28 NA
Trip Blank Analyses	NA ALL ND NA	MA ALL ND MA	NA NA ALL ND	N N N N N N N N N N N N N N N N N N N	X X X X X
Volatile MS/MSD Analyses		ALL WITHIN LIMITS			
Volatile Surrogate Recovery	ALL WITHIN LIMITS	ALL WITHIN LIMITS	ALL WITHIN LIMITS	ALL WITHIN LIMITS	ALL WITHIN LIMITS
Laboratory Identification Number	80420HV04J1 15928-01 15928-02 15928-03	80421HVO4J1 15928-10 15928-09 15928-08 15928-06 15928-06 15928-06 15928-06 15928-06	804284V04J1 15928-11 15928-12 15928-13	*0503NVOHS1 -5928-14 15928-15 15928-16 15928-17 15928-20 15928-21 15928-22 15928-22 15928-22	80504NVOMS1 15928-26 15928-27 15928-28 15928-29
SAIC Sample Number	METHOD BLANK (WATERS) EB-1 TB-1 EB-3	METHOD BLANK (WATERS) FB-1 TB-3 EB-7 EB-5 EB-5 EB-4 TB-2 EB-7MS	HETHOD BLANK (WATERS) EB-8 EB-9 TB-4	HETHOD BLANK (WATERS) EB-10 EB-11 TB-5 MN1-13 TB-6 MN1-14 MN3-1 MN3-2 MN3-2 MN3-2 MN3-2 MN3-5 MN3-5	METHOD BLANK (WATERS) EB-12 EB-13 EB-14 FB-2

TABLE F-31. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR VOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

NAIIUNAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)	Field Significant Tentatively Blank Sample Identified Analyses Results Compounds	NA ACE=41ug/Kg None De None De Na XYL=3ug/Kg None De Na ACE=37/XYL=2ug/Kg None De Na HeCl2=3/ACE=49ug/Kg None De Na None De Na Hangara None De Na Na None De Na	NONE DETECTED NONE DETECTED NONE DETECTED NONE DETECTED NO ANALYTES DETECTED NONE DETECTED		NOME DETECTED NO ANALYTES DETECTED NO ANALYTES DETECTED XYL=1ug/L ETHBENZ=58/XYL=359ug/L TOTAL=1200ug/L TOTAL=1100ug/L NOME DETECTED NOME DETECTED NOME DETECTED NOME DETECTED	NO ANALYTES DETECTED NONE DETECTED	FB-3  NO ANALYTES DETECTED  TOTAL=460ug/L  NO ANALYTES DETECTED  NO ANALYTES DETECTED  TOTAL=1880ug/L
FOSS FIELD, SIOUX FALLS,	int is		RI ACE=7/T0L=2/XYL=1ug/L		EB-15		EB-15 FE
NAL GUARD, JOE	Trip Blank Analyses	*****	ACE=8ug/L		9-81		18-9
	Volatile MS/MSD Analyses	ALL WITHIN LIMITS		ALL WITHIN LIMITS			
AL SWIN DAKULA AIK	Volatile Surrogate Recovery	ALL WITHIN LIMITS	ALL WITHIN LIMITS		ALL WITHIN LIMITS		ALL WITHIN LIMITS
ξ	Laboratory Identification` Number	B0509NV0SJ1 15928-117 15928-118 15928-119 15928-120 15928-117MS	80802MV0UJ1 8907065-01 8907065-02 8907065-03 8907065-03 8907065-05 8907065-06	8907065-15 8907065-19 8907065-19MS 8907065-19MSD	80802M0Us1 8907065-09 8907065-12 8907065-14 8907065-15 8907065-16 8907065-17 8907065-17	8907065-20	B0804MV0WJ2 8907065-07 8907065-08 8907065-11
	SAIC Sample Number	METHOD BLANK (SOILS) BK3-25 BK3-0.5 BK3-5.6 BK3-20 BK3-20 BK2-25HSD	METHOD BLANK (WATERS) TB-9 FB-3 EB-15 GW1-1 GW1-3 GW1-4 GW1-4	SW-2NS SW-2NS SW-2NS	METHOD BLANK (WATERS) GW1-6 GW1-10 GW1-12 GW1-12DL GW1-13 SW-1	SH-3	METHOD BLANK (WATERS) GW1-5 GW1-8

TABLE F-31. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR VOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

م ج	None Detected Total=38ug/Kg	None Detected None Detected None Detected None Detected None Detected Total=3800ug/Kg	None Detected None Detected None Detected None Detected None Detected None Detected	None Detected Total=24000ug/Kg Total=42000ug/Kg	None Detected Total =290ug/Kg None Detected
	MeC12=5ug/Kg ALL ND MeC12=4ug/Kg MeC12=4ug/Kg MeC12=8/ACE=52ug/Kg MeC12=8/ACE=71ug/Kg	MeC12=3/ACE=61ug/Kg MeC12=3/ACE=36ug/Kg MeC12=4/ACE=62ug/Kg MeC12=3/ACE=57ug/Kg MeC12=5/ACE=49ug/Kg	MeC12=8ug/Kg MeC12=6/ACE=32ug/Kg MeC12=6ug/Kg MeC12=6ug/Kg MeC12=6/ACE=39ug/Kg MeC12=6/ACE=58ug/Kg MeC12=6/ACE=54ug/Kg	ALL ND (RAISED DLs) ALL ND (RAISED DLS)	ACE=30vg/Kg ACE=61vg/Kg ACE=67vg/Kg ACE=75vg/Kg ACE=55vg/Kg ACE=55vg/Kg ACE=55vg/Kg
Field Blank Analyses	*****	******	******	X X	*******
Equipment Wash Analyses					
	*****	********	*******	<b>*</b> *	*****
atile /MSD lyses		ALL WITHIN LIMITS			i.
کر او کارو	!				S TEGE
Volatile Surrogate Recovery	ALL WITHIN LIMITS	ALL WITHIN LIMITS	ALL WITHIN LIMITS	ALL UITHIN LIMITS	ALL WITHIN LIMITS EXCEPT WHERE NOTED TOL XR=57
tory fication	B0421NV0SS1 ALL 15928-91 UITHIN 15928-90 LIMITS 15928-89 15928-93 15928-94 15928-94	80424MVOSS1 ALL 15928-95 LINITS 15928-96 LINITS 15928-98 15928-98MS 15928-98MS 15928-98MS	804274VOSJ1 ALL 15928-101 UITHIN 15928-103 LIMITS 15928-103 15928-104 15928-105 15928-107	B0509MVOSJ2 ALL 15928-109 WITHIN 15928-108 LIMITS	B0508HVOSJ1 ALL WITH 15928-110 LIMITS E: 15928-111 WHERE NO 15928-115 15928-114 15928-116 TOL XR=5 15928-116RE TOL XR=5

TABLE F-32. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATTLE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA

Semivolatile Blank Analyses	bzethhexplt(1J) NO OTHER INTERFERENTS DETECTED	NO INTERFERENTS DETECTED	bzethHexPhlt(1J) NO OTHER INTERFERENTS	DETACKON ((1)) NO OTHER INTERFERENTS DETECTED	NO INTERFERENTS DETECTED
Continuing Calibration Verification	1D24A::D2 ALL SPCC/CC CRITERIA MET XD VALUES>20: MCICP(22) 33-DCERX(36) ALL OTHERS <20	LEOIB::DZ ALL SPCC/CCC CRITERIA MET OTHER %D VALUES>20: BENZYL-OH(50) ALL OTHERS <20	LE018::02	LE10A:::SS ALL SPCC/CCC GETTERIA MET OTHER XD VALUES >20: 4CHLORGANILIME(25) HEXCIBUT(23) 4CLISCHSPAT(20) HEXCIBCT(CPENT(25) 4BrPhPETHER(25) HEXCIBCT(25) 35CLIBCTX(21) 52ETHHERPH(133) DINBPH(1(22) ALL OTHERS <20.	LEIDA:::SS LEIDA:::SS LEIDA:::SS LECAA::D2 ALL CCC/SPCC CRITERIA MET OTHER XD VALUES>20x: D2CLISOPROPETH(45) INITRODINGPROPYL(28) BENZOIC-H(25) 4CIANILINE(26) 4AITROANILINE(25) ALL OTHERS <20x.
Initial Calibration Verification	LKO4BC11-04-88) ALL TUNING CRITERIA MET ALL SPCC/CCC CRITERIA MET	LK04B(11-04-88)	LK04B(11-04-88)	LK04B(11-04-8B)	LK04B(11-04-88) LK04B(11-04-88)
Semivolatile Tuning/Mass Calibration	LD24A ALL Criteria Het	LE018:ALL CRITERIA MET	LEO18:ALL CRITERIA MET	LE10A ALL CRITERIA MET	LE10A LE10A LE24A:ALL LE24A:CRITERIA LE24A:MET LE24A LE24A
Date Analyzed	88-72-70 68-72-70 68-72-70 68-72-70 67-72-88 68-72-70 68-72-70 76-72-88	05-01-89	05-01-89 05-01-89 05-01-89	05-10-89 05-10-89 05-10-89 05-10-89	05-10-89 05-10-89 05-10-89 05-24-89 05-24-89 05-24-89
	04-18-89 04-18-89 04-18-89 04-18-89 04-18-89 04-18-89 04-18-89	04-25-89	04-28-89 04-28-89 04-28-89	05-03-89 05-03-89 05-03-89 05-03-89	05-03-89 05-03-89 05-03-89 05-03-89 05-03-89 05-03-89
Date Collected	04-11-89 04-13-89 04-15-89 04-15-89 04-17-89 04-17-89	04-19-89	04-25-89 04-26-89	04-27-89 04-27-89 04-27-89 04-28-89	05-01-89 04-30-89 04-30-89 05-01-89 05-02-89 05-02-89
Laboratory Identification Number	804 18MSVALM 15928-01 15928-05 15928-05 15928-06 15928-06 15928-08 15928-08MS	80425HSVALM 15928-10	80428MSVULO 15928-11 15928-12	B0503MSVWLG 15928-14 15928-14MS 15928-14MSD 15928-15	80503#SVVLH 15928-21 15928-19 15928-20 15928-22 15928-22 15928-23
SAIC Sample Number	METHOO BLANK:SBLKL1 EB-1 EB-5 EB-5 EB-6 EB-7	METHOO BLANK:SBLKL2 FB-1	METHOD BLANK:SBLKL3 EB-8 EB-9	METHOD BLANK:SBLKL5 EB-10 EB-10 EB-11	SBLKL6A HW3-2 HW1-13 HW1-14 HW3-20UP HW3-3 HW3-4

TABLE F-32. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

		SS NO EXECTOR INTERFERENTS CC/CCC INTERFERENTS IA MET DETECTED CONTRACTS CON	henol(22) LINE(24) ylPen(31) HERS <20%.			
			24DCFPI 4CLANII HEXCLC ALL OTI			
Initial Calibration Verification	LK04B(11-94-86)	LK04B(11-04-88)				
Semivolatile Tuning/Mass Calibration	LEZSC:ALL CRITERIA MET	LE11B:ALL CRITERIA LE11B:MET	LE118:	LE118 LE118 LE118	LE!18	LE118
Date Analyzed	05-24-89	05-11-89 05-11-89	05-11-89	05-11-89 05-12-89 05-12-89	05-12-89	05-12-89
		05-04-89	05-04-89	05-04-89 05-04-89 05-04-89	05-04-89	05-04-89
_	65-01-89	64-30-89	06-30-89	04-30-89 04-30-89 04-30-89	04-30-89	04-30-89
Laboratory Identification Number	15928-25	B0504MSVVLG 15928-32	15928-33	15928-35 15928-36 15928-37	15928-38	15928-39
SAIC Sample Number	M43-5	METHOD BLANK:SBLKL6 MW1-3	4-1HH	MU1-5 HU1-6 HU1-7	MU1-8	HU1-9
	Laboratory Samivolatile Initial Continuing ie Identification Date Date Tuning/Mass Calibration Calibration sr Number Collected Extracted Analyzed Calibration Verification	Laboratory Date Date Iuming/Mass Calibration Verification Verification Calibration Calibration Verification Verification Calibration Calibration Verification Verification Calibration Calibration Calibration Verification Verification Calibration Verification Verification Calibration Calibration Verification Verification Calibration Calibration Calibration Verification Verification Calibration Calibration Calibration Calibration Calibration Calibration Verification Calibration Calibr	Laboratory	Identification   Laboratory   Laboratory	Indentification   Date   Dat	Laboratory   Lab

TABLE F-32. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIOWAL GUARD, JOE FOSS FIELD, SICUX FALLS, SOUTH DAKOTA (CONTINUED)

Semivolatile Blank Analyses		bZethHexPhtt(1J) NO OTHER INTERFERENTS DETECTED			
Continuing Calibration Verification	LE12A:05-12-89 ALL SPCC CRITERIA HET CCC VALUES >25%: HEXCIBUTC6) ALL OTHER VALUES<25% AND OTHER VALUES<26% HEXCIGHT(26%) HEXCIGHT(26%) ALL OTHER XD VALUES<20.	LE15A::SS(05-15-89) ALL SPCC/CC CSCTIFER, MET OTHER 2D VALUES > 20%: b2C11SOPROPETHER(20) 24.0CPHENOL(20) 24.0LUINE2) HEXCLOUT(24) HEXCLCYLPENTA(30) 35.0C16ENZIDINE(25) b2ETHHEXPHLT(28) 246TBP(22)	LE18A::SS LE18A::SS LE18A::SS	LE19D2(05-19-89) ALL SPCC/CCC CRITERIA MET OTHER XD VALUES>20X: b2CLISOPKOPETHER(29) HEXCLBUT(25) 246TBP(26) ALL OTHERS <20X.	LE228::SS LE228::SS LE228::SS
Initial Calibration Verification	LK04B(11-04-88)	LK04B(11-04-8B)		LK048(11-04-88)	
Semivolatile Tuning/Mass Calibration	LE12A:ALL LE12A:CRITERIA LE12A:HET	LE15A:ALL LE15A:CRITERIA LE15A:HET LE15A LE15A LE15A LE15A	LE18A:ALL LE18A:CRITERIA LE18A:MET	LE19A:ALL LE19A:CRITERIA MET	LE22B:ALL LE22B:CRITERIA LE22B:MET
Date Analyzed	05-12-89 05-12-89 05-12-89	05-15-89 05-15-89 05-15-89 05-15-89 05-15-89 05-16-89	05-18-89 05-18-89 05-18-89	05-20-89**	05-23-89** 05-23-89** 05-23-89**
Date Extracted	05-04-89 05-04-89 05-04-89	05-12-89 05-12-89 05-12-89 05-12-89 05-12-89 05-12-89	05-12-89 05-12-89 05-12-89	05-12-89	05-12-89 05-12-89 35-12-89
Date Collected	04-30-89 04-30-89 04-30-89	04-30-89 04-30-89 05-01-89 05-01-89 05-01-89	05-01-89 05-01-89 05-02-89	05-01-89 04-30-89	05-01-89 05-02-89 04-30-89
Laboratory Identification Number	15928-40 15928-41 15928-42	B0512MSVULK 15928-18RE 15928-19RE 15928-23RE 15928-23RE 15928-23MS	15928-21RE 15928-22RE 15928-24RE	15928-25RE 15928-26RE	15928-27RE 15928-28RE 15928-29RE
SAIC Sample Number	#1-10 #1-11 #1-12	METHOD BLANK:SBLYL7 MJ1-13 MJ1-14 MJ3-1 MJ3-3 MJ3-3 MJ3-3	MV3-2 MV3-2 MV3-4	MU3-5 E8-12	EB-13 EB-14 FB-2

TABLE F-32. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA (CONTINUED)

Semivolatile Blank Analyses	bzethhexphit(2) NO OTHER INTERFERNTS DETECTED	bZethHexPhlt(1J) NO OTHER INTERFERENTS DETECTED
Continuing Calibration Verification	LE18A::SS(05-18-89 ALL SPCC/CC CRITERIA MET OTHER XD VALUES>20X: 4CLANILINE(25) HEXCLGUI(23) HEXCLCYLPENTA(35) 4NITROPHENOL(21) 4NITROPHENOL(21) 530CLBENZIOINE(27) 52ETHEXPHLI(28) DINSPHLI(20) ALL OTHERS<20X.	LE22B::SS(05-22-89) ALL CCC/SPCC CRITERIA MET OTHER XD>20: b2CCLETHYLVINYLETHER(31) 4-CLANILINE(22) HEXCLBUT(23) ALL OTHERS<20;
Initial Calibration Verification		LK04B(11-04-88)
Semivolatile Tuning/Mass Calibration	LE18A LE18A LE18A LE18A	LE228:ALL LE228:CRITERIA LE228:MET LE228 LE228 LE228
Date Analyzed	05-18-89 05-18-89 05-18-89	05-22-89** 05-22-89** 05-22-89** 05-22-89 05-22-89 05-22-89
Date Extracted	05-15-89 05-15-89 05-15-89 05-15-89	05-13-89 05-13-89 05-13-89 05-13-89 05-13-89 05-13-89
Date Collected	04-30-89 04-30-89 04-30-89	04-30-89 04-30-89 04-30-89 04-30-89
Laboratory Identification Number	B0515H5VVLO 15928-40RE 15928-43RE 15928-43RE	B0513M5VVLK 15928-37RE 15928-34RE 15928-35RE 15928-36RE 15928-36RE 15928-39RE
SAIC Sample Yumber	METHOD BLANK:SBLKL8 isu1-10 mw1-11 ku1-12dup	METHOD BLANK:SBLKL9 M41-1 M41-40UP M41-5 M41-6 H41-8 M41-9

** Exceed CLP holding time limits set for water.

TABLE F-32. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR MATIONAL GLARD. JOE FOSS FIFID. STORY FALLS SOUTH DAKOTA ACCURTAMENT

SAIC Sample Number	Laboratory Identification Number	Date Collected	Date Extracted	Date Analyzed	Semivolatile Tuning/Mass Calibration	Initial Calibration Verification	Continuing Calibration Verification	Semivolatile Blank Analyses
METHOD BLANK:SBLKL10 E1-1-15	80427MSVSL1 15928-76	04-11-89	04-27-89	05-26-89	LE26A:ALL CRITERIA MET	LK648(11-04-88)	LE26A::SS ALL SPCC/CC CRITERIA MET OTHER XD VALUES >20: b2clis/PROPETH(33)	NO INTERFERENTS DETECTED
81-2-15	15928-78	04-13-89	04-27-89*	05-25-89	LEZ6A	*	2C(MAPH(Z1) BUTBENZPHTHLT(25) bZETHEKPHTHLT DNOCTPHTHLT(20) 1123cdPYR(22)	
61-2-25	15928-79	04-13-89	04-27-89*	05-26-89	LE26A			
METHOD BLANK:SBLKL11 81-1-25	B0418#SVSL1 15928-77	04-11-89	04-18-89 04-18-89	05-26-89 05-26-89	LE26A:ALL CRITERIA METLK04B(11-04-88)	:TLKO4B(11-04-88)	LE26A::SS LE26A::SS	NO INTERFERENTS DETECTED
81-1-25 81-1-25	15928-774S 15928-774SD	04-11-89 04-11-89	04-18-89 04-18-89	65-26-89 05-26-89			LE26A::SS LE26A::SS	
METHOD BLANK:SBLKL12 MW1-12-15	80506MSVSLG 15928-108	04-27-89	05-06-89 05-06-89	05-30-89 05-30-89	LE308:ALL LE308:CRITERIA MET	LK04B(11-04-88)	LE308:::SS ALL CCC/SPCC CRITERIA MET	NO INTERFERENTS DETECTED
Mr.1-12-15 HVI-12-150UP HVI-12-20 HVI-13-15 HVI-13-20	15928-10845 15928-108450 15928-109 15928-110 15928-111	04-27-89 04-27-89 04-27-89 04-27-89 04-27-89	05-06-89 05-06-89 05-06-89 05-06-89 05-06-89 05-06-89	05-30-89 05-30-89 05-31-89 05-31-89 05-31-89	LE308 LE308 LE308 LE308 LE308 LE308		OTHER XD VALUES-20: b2C11SOPROPETH(38) 4CLANIL INE(20) PYRENE(22) 33DC1BENZ(39) b2ETHHEXPHTH(7(29) 1123cdPTR(31) D1BENZABANTH(31) A1 OTHERS-20X.	

TABLE F-32. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Semivolatile Blank Analyses		NO INTERFERENTS DETECTED	NO INTERFERENTS DETECTED		
Continuing Calibration Verification	LE314::SS ALL CCC/SPCC CRTTERIA MET OTHER XD VALUES>20: 2CIPHENOL(21) b2CLISOROPETH(35) 4CIANILINE(22) 330iCIBENZ(43) BENZOKFL(21) DiBENZOMATH(30) BENZOMATH(30) ALL OTHERS <20.	LE31A::SS LE31A::SS LE01A::SS ALL CCC/SPCC CRITERIA MET OTHER XD VALUES>20: DLOLISOPOETH(42) 4CLAUINE(22) BUTBENZPH:R.I.(26) 3301CIBENZ(48) BENZOFLUOR(20.3) DIOS-COPPHHITT(23) BENZOFLUOR(20.3) DIBENZAMATH(22) BENZOFALOR(27) ALL OTHERS <20X.	LE018::02 LE26A::SS	LE26A::SS LF01A::SS LF01A::SS LF01A::SS	LFOZA::SS ALL CCC/SPCC CRITERIA MET OTHER XD VALUES>20: 2C(PHENOL(21) 2C(I)NOSPHENOL(22) 3ADICLENA(35) DINCTPHIHL'(22) ALL OTHERS<20X.
Initial Calibration Verification	LK048(11-04-88)	LK04B(11-04-8B)			LK04B(11-04-8B)
Semivolatile Tuning/Mass Calibration	LE31A:ALL LE31A:CRITERIA LE31A:MET LE31A LE31A LE31A LE31A	LE31A LE31A LF01A:ALL LF01A:CRITERIA LF01A:MET LF01A LF01A	LE01B LE26A	LE26A LF01A LF01A LF01A	LF02A:ALL OK
Date Analyzed	05-31-89 05-31-89 05-31-89 05-31-89 05-31-89 06-31-89 06-01-89	06-01-89 06-01-89 06-01-89 06-01-89 06-01-89 06-01-89	05-01-89 05-27-89	05-27-89 06-01-89 06-02-89 06-02-89	06-03-89
Date Extracted	05-06-89 05-06-89 05-06-89 05-06-89 05-06-89 05-06-89	05-03-89 05-03-89 05-03-89 05-03-89 05-03-89 05-03-89	04-25-89 04-25-89	04-25-89 04-25-89 04-25-89 04-25-89	04-25-89
Date Collected	04-28-89 04-28-89 04-28-89 04-28-89 04-28-89 04-28-89 04-28-89	04-25-89 04-25-89 04-26-89 04-26-89 04-26-89 04-26-89	04-14-89	04-14-89 04-14-89 04-14-89 04-14-89	04-15-89
Laboratory Identification Number	15928-113 15928-115 15928-115 15928-116 15928-117 15928-118 15928-119	B0503MSVSLK 15928-101 15928-103 15928-104 15928-106 15928-106	B0425MSVSL1 15928-83	15928-80 15928-85 15928-86 15928-87	15928-90
SAIC Sample Number	Mul-14-15 Mul-14-20 BK-2-15 BK-2-25 BK3-0.5 BK3-0.5 BK3-20	METHOO BLANK:SBLKL13 HU1-9-15 HU1-9-20 HU1-10-15 HU1-10-20 HU1-11-15 HU1-11-15	METHOD BLANK:SBLKL4 B3-2-ODUP	83-1-0 83-3-00UP 83-3-00UP 83-3-2.5	83-5-0

TABLE F-32. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SENIVOLATILE ORGANIC COMPOUNDS
AT SOITH DAKOTA ATB MATICALA CIARD. THE FOSS STEIN STORY FALLS CONTUBARDA ACCULTABLE.

Semivolatile Blank Analyses		·	NN INTERFERENTS DETECTED
Continuing Calibration Verification		LH03A:08-03-89 ALL SPCC/CCC CRITERIA MET OTHER XD VALUES >20: bisOPROPYLAMINE(39) nNITROSOGIAPROPYLAMINE(32) 1SOPHORONE(20) BENZOICACID(33) 4CCIANILINE(28) HEXCICYLPENI(23) 2ADINOSPHENOL(25) ANILINE(50) ALL OTHER XDS<20.	LHOBA:08-08-89 ALL SPCC/CCC CTITERIA HET OTHER XD VALUES > 20: b2CIISOPROPYLANINE(44) nNITROSOdinPROPYLANINE(32) ISOPHORNME(23) BENZOICACID(25) 4CLANILINE(34) DIBENZAHANIH(20) BERNZAHANIH(20) ANILINE(51) 2461F18PPHENOL(22) ALL OTHER XDS<20.
Initial Calibration Verification		·	LK04B(11-04-88)
Semivolatile Tuning/Mass Calibration	LH02A	LHO35:ALL CRITERIA LHO35:MET	LH08A:ALL LH08A:CRITERIA LH08A:MET LH08A LH08A LH08A
Date Analyzed	08-03-89	08-03-89 08-03-89	08-08-89 08-08-89 08-08-89 08-08-89 08-08-89
Date Extracted	07-27-89	07-27-89 07-27-89	08-03-89 08-03-89 08-03-89 08-03-89 08-03-89
Date Collected	07-26-89	07-26-89 07-26-89	07-25-89 07-25-89 07-25-89 07-25-89 07-25-89
Laboratory Identification Number	8907065-18	8907065-19 8907065-20	TERS) B0803MSVMLS 8907065-04RE 8907065-05RE 8907065-10RE 8907065-11RE
SAIC Sample Number	SH-1	SH-3 SH-3	METHOD BLANK (WATERS) GW1-1 GW1-3 GW1-6 GW1-7 GW1-8

TABLE F-32. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATILE ORGANIC COMPOUNDS AT SQUIH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SQUIH DAKOTA (CONTINUED)

Semivolatile Blank Analyses	
Continuing Calibration Verification	LH094:08-09-89 ALL SPCC/CCC CRITERIA MET OTHER XD VALUES >20: D2CLISOPROPYLAMINE(39) ISOPHORONE(22) 9ENZOICACID(28) 4CLIMILINE(35) HEXCLCTLPENT(23) 24D iNO3PHENOL(24) ANITROANILINE(26) BENZOHER(54) 246ITIBPPHENOL(22) ALLINE(54) 246ITIBPPHENOL(22)
Initial Calibration Verification	·
Semivolatile Tuning/Mass Calibration	LHO9A:ALL LHO9A:NET LHO9A:MET
Date Analyzed	08-09-89 08-09-89 08-09-89
Date Extracted	08-03-89 08-03-89
Date Collected	07-25-89 07-25-89 07-25-89
J - Z	8907065 - 14RE 8907065 - 17RE 8907065 - 17RE
SAIC Sample Number	GW1-11 GW1-13 GW1-14

TABLE F-33. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIQUX FALLS, SOUTH DAKOTA

Tentatively Identified Compounds	None Detected Total=21ug/L Total=26ug/L Total=16ug/L Total=12ug/L Total=34ug/L	None Detected Total=31ug/L	None Detected Total=12ug/L Total=11ug/L	None Detected None Detected	Total=27ug/L	None Detected
cant	TECTED TECTED TECTED TECTED TECTED TECTED TECTED TECTED	NO ANALYTES DETECTED	NO ANALYTES DETECTED bzethhexphthlf(48)	NO ANALYTES DETECTED	Ь2ЕТННЕХРНТИLТ(28)	<b>b</b> 2ETHHEXPHTHLT(5) <b>b</b> 2ETHHEXPHTHLT(34), <b>b</b> iNOCTPHTHLT(2) <b>b</b> 2ETHHEXPHTHLT(34), <b>b</b> 100CTPHTHLT(2) <b>b</b> 2ETHHEXPHTHT(21) <b>b</b> 2ETHHEXPHTHLT(3) <b>b</b> 2ETHHEXPHTHLT(3)
Semivolatile MS/MSD Analyses	ALL WITHIN LIMITS			ALE UITHIN	S	
Semivolatile Surrogate Recovery	ALL SURROGATES WITHIN LIMITS	ALL SURROGATES WITHIN LIMITS	ALL SURROGATES LITHIN LIMITS	ALL SURROGATES WITHIN LIMITS		TPH=33 PHL=0/2FP=2 PHL=0/2FP=0 PHL=1/2FP=3 PHL=1/2FP=1 PHL=1/2FP=1 PHL=1/2FP=1
	80418MSVMLM 15928-01 15928-05 15928-06 15928-06 15928-07 15928-08 15928-08MS	80425мsvиlм 15928-10	80428MSVWLO 15928-11 15928-12	15928-14 15928-14 15928-14	15928-14HSD 15928-15	80503MSVWLH 15928-21 15928-18 15928-19 15928-20 15928-22 15928-22
	METHOD BLANK:SBLKL1 EB-1 EB-4 EB-5 EB-6 EB-7 EB-7	METHOD BLANK:SBLKL2 FB-1	METHOD BLANK:SBLKL3 EB-8 EB-9	METHOD BLANK:SBLKL5 EB-10 EB-10	EB-11	SBLKL6A MV3-2 MV1-13 MV1-14 MV3-1 MV3-2 MV3-3

TABLE F-33. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

	Tentatively Identified Compounds	Total=20ug/L	None Detected	1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000 1,000	Total=920ug/L	None Detected None Detected Total=190ug/L	Total=950ug/L	None Detected
THE GOARD, GOT 1923 FIELD, SIGON FALLS, SQUIN DANGIA (CONTINUED)	Significant Sample Results	Б2ЕТННЕХРНТИLT(14)	CONGRESSION	ACE(7),DiBENZFUR(3) FLUOR(6),PHF14(17) ANTH(7),FLUORANTH(20) PYR(22),BENZORANTH(7) CRFYS(7),DZEHTHEXPHTHLT(44) BENZOBFLUOR(6X) BENZOKFLUOR(6X) ALL OTHERS ND	NAPH(20), 2CH3NAPH(6) ACE(2), FLUOR(2) PHEN(2), FLUORANTH(4) PYR(4), b2ETHHEXPHTHLT(27)	Ь2ЕТИНЕХРИТИLT(8) Ь2ЕТИНЕХРИТИLT(57) 24D iCH3PHNOL(2) Ь2ЕТИНЕХРИТИLT(14)	NAPH(4), 2CH3NAPH(6) b2ehthexphthl1(4)	Ь2ЕНТНЕХРИТН[Т(2)
T CC 1 CC	Semivolatile MS/MSD Analyses							
	Semivolatile Surrogate Recovery	PHL=8/2FP=12	ALL SURROGATES WITHIN	LIMITS	אור סע	PHL/2FP=0/13P=9 PHL/2FP=0 ALL OK	PHL=9/2FP=13	PHL/2FP=0
	Laboratory Identification Number	15928-25	80504MSVMLG 15928-32		15928-33	15928-35 15928-36 15928-37	15928-38	15928-39
	SAIC Sample Number	M43-5	HETHOD BLANK:SBLKL6 MH1-3		Mu1-4	Mu1-5 Mu1-6 Mu1-7	HU1-8	MU1-9

TABLE F-33. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Tentatively Identified Compounds None Detected None Detected Total=1700ug/L
Significant Sample Results bZETHHEXPHTHIT(48) DinBUTPHTHLT(4), bZETHHEXPHTHLT(640) NAPH(84), ZCH3NAPH(48), bZETHHEXPHTHLT(55)
Semivolatile HS/HSD Analyses
Semivolatile Surrogate Recovery PHL.ZFP=0 PHL=0/ZFP=1
Laboratory Identification Number 
SAIC Sample Number MM1-10 MM1-11

None Detected None Detected None Detected None Detected None Detected	Total=9ug/L Total=10ug/L Total=9ug/L None Detected Total=24ug/L	Total=23ug/L Total=24ug/L Total=13ug/L
<b>Б2ЕТНИЕХРНТИLТ(7В)</b> <b>Б2ЕТНИЕКРНТИLТ(40В)</b> <b>Б2ЕТНИЕХРНТИLТ(3В)</b> <b>Б2ЕТНИЕХРНТИLТ(3В)</b>	<b>b</b> 2ETHHEXPHTHLT(38) <b>b</b> 2ETHHEXPHTHLT(28) <b>b</b> 2ETHHEXPHTHLT(148) <b>b</b> 2ETHHEXPHTHLT(178) <b>b</b> 2ETHHEXPHTHLT(388)	NO ANALYTES DETECTED NO ANALYTES DETECTED NO ANALYTES DETECTED
ALL OK PHL-2FP=0/T8P=7 PHL=0/ZFP=1 PHL=1/ZFP=3 PHL=0/ZFP=1 ALL OK ALL WITHIN ALL OK LIMITS	PHL=0/2FP=2 PHL=1/2FP=3 PHL=1/2FP=3 PHL=6/2FP=8 ALL OK	ALL OK ALL OK ALL OK
80512MSVALK 15928-18RE 15928-19RE 15928-20RE 15928-23RE 15928-23MS 15928-23MS	15928-21RE 15928-22RE/DUP 15928-24RE 15928-25RE 15928-26RE	15928-27RE 15928-28RE 15928-29RE
HETHOO BLANK:SBLKL7 MJ1-13 MJ2-14 MJ3-3 MJ3-3 MJ3-3	M.3-2 M.3-2 M.3-4 M.3-5 EB-12	E8-13 E8-14 F8-2

TABLE F-33. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIGUX FALLS, SOUTH DAKOTA (CONTINUED)

Tentatively Identified Compounds	None Detected None Detected None Detected Total=1400ug/L	None Detected None Detected Total=710ug/L	Total=11ug/L Total=11ug/L Total=710ug/L Total=9ug/L	Total=4470ug/kg Total=17990ug/Kg
Significant Sample Results	Ь2ЕТННЕХРИТИLT(48В) Ь2ЕТНИЕХРИТИLT(17В) NAPH(72),2CH3NAPH(46),Ь2ЕТННЕХРИТИLT(19В)	BZETHHEXPHTHLT(5B) 24Di(14), ZCH3NAPH(4), NAPH(14), ZCH3NAPH(4), ACE(2), FLUOR(2) FLUORANTH(3), PYR(3)	<b>Б2ЕТННЕХРИТИLТ(3В)</b> <b>Б2ЕТННЕХРИТИLТ(12В)</b> <b>Б2ЕТНИЕХРUTИLT(2В)</b> <b>Б2ЕТНИЕХРИТИLT(2В)</b>	NAPH(89), 2CH3NAPH(260), ACE(250)
Semivolatile IS/MSD Analyses			H=28/T8P=2 P=7	S S
Senivolaine Surcogete Reseven	ALL DX PHL=1/2FP=3 PHL=2/2FP=5 LTP=1§	ALL OK ALL OK 2FP=20	PHL/2FP=0/TPH=28/TBP=2 PHL/2FP=1/TBP=7 PHL=0/2FP=5 PHL=8/2FP=14	ALL SURROGATES WITHIN LIMITS
Laboratory Identification Number	B0515HSVHLQ 15928-40RE 15928-41RE 15928-43RE	B0513HSV4LK 15928-31RE 15928-34RE	15928-35RE 15928-36RE 15928-38RE 15928-39RE	80427MSVSL1 15928-76
SAIC Sample Kunber	METHOD BLANK:SBLKL8 MW1-10 MW1-11 MW1-12DUP	HETHOD BLANK:SBLKL9 MW1-1 MW1-4DUP	MU1-5 HU1-6 HU1-8 HU1-9	METHOO BLANK:SBLKL10 B1-1-15

None Detected None Detected Total=710ug/L	Total=11ug/L Total=11ug/L Total=710ug/L Total=9ug/L	Total=4470ug/kg Total=17990ug/kg	Total=24400ug/Kg	Total=43900ug/Kg
bZETHHEXPHTHLT(5B) 240iCH3SHENOL(5) NAPH(14),2CH3NAPH(4), ACE(2),FLUOR(2) FLUORANTH(3),PYR(3)	<b>Б2ЕТННЕХРИТИLТ(3В)</b> <b>Б2ЕТННЕХРИТИТ(12В)</b> <b>Б2ЕТННЕХРИТИLT(2В)</b> <b>Б2ЕТННЕХРИТИLT(2В)</b>	MAPH(89), 2CH3MAPH(260), ACE(250) DIBENZOFURAN(130), FLUOR(300) PHEN(1900), ANNHR(490), FLUORANTH(1500) PYR(1600), BENZANTH(690), CHRYS(640) LZETHHEXPHTHL(48), BENZBFLUOR(450) BENZKFLUOR(370), BENZBPYR(460) IND123cdPYR(220), BENZBPYR(180)	MAPH(330), 2CH3NAPH(600), ACE(77) DIBENZOFURAN(46), FLUOR(81), PHEN(360) ANTH(110), FLUORANTH(360), PYR(530) BENZAAHT(150), CHRYS(180), DZEHTHEXPHTHLT(94), BENZAELUOR(160), BENZELUOR(100), BENZAPR(140) IND123cdPYR(71J), BENZGhIPER(58J)	NAPH(650), 2CH3NAPH(900), ACE(130) DIBENZOFURAN(81), FLUOR(150), PHEN(630) ANTH(210), DiaBUTPHTHLT(91), FLUOR(690) PYR(770), BENZAANTH(330), CHRYS(320) b2ETHEXPHTHT(130), BENZOFLUOR(250) BENZKFLUOR(160), BENZAPYR(230), IND123cdPYR(120) BENGHIPERL(98)
ALL OK AFL OK 2FF=20	PHL/2FP=0/TPH=28/T8P=2 PHL/2FP=1/T8P=7 PHL=0/2FP=5 PHL=8/2FP=14	ALL SURROGATES WITHIN LIMITS		
15928-34RE 15928-34RE	15928-35RE 15928-36RE 15928-38RE 15928-39RE	15928-76 15928-76	15928-78	15928-79
MM1-1 MW1-4DUP	MU1-5 MU1-8 MU1-9	METHOO BLANK:SBLKL10 B1-1-15	81-2-15	81-2-25

TABLE F-33. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Tentatively Identified Compounds	Total=4190ug/Kg Total=9110ug/Kg		Total=6690ug/Kg Total=28320ug/Kg	Total=11110ug/Kg Total=6800ug/Kg Total=6550ug/Kg Total=6740ug/Kg	Total=7320ug/Kg Total=6560ug/Kg Total=5670ug/Kg Total=6080ug/Kg Total=5890ug/Kg Total=5880ug/Kg Total=5880ug/Kg	Total=4620ug/kg Total=6100ug/Kg Total=6450ug/Kg Total=5450ug/Kg Total=57380ug/Kg Total=5790ug/Kg Total=5590ug/Kg
Significant Sample Results	NAPH(37J), 2CH3NAPH(62), ACE(74) DIBENZOFIRAN(45), FLUOR(45), PHEN(650) ANTH(170, FLUOR(430), PYR(510) BENZANTH(220), CHRYS(220), AETHHEXPHTHLT(63B) BENZSFLUOR(170), BENZKFLUOR(110), BENZAPYR(170) IND12SCCPYR(75J), BENZSHIPERL(62J)		NAPH(300), 2CH3NAPH(820), DIBENZOFURAN(17J) FLUOR(43), bzethhexphihlt(24J)	2CH3NAPH(110),DiCH3PHTHLT(14J) NO ANALYTES DETECTED NO ANALYTES DETECTED NO ANALYTES DETECTED	NO ANALYTES DETECTED	NO ANALYTES DETECTED bZETHHEXPHTHLT(39) NO ANALYTES DETECTED(CBZETHHEXPHTHLT=34J) bZETHHEXPHTHLT(40) NO ANALYTES DETECTED NO ANALYTES DETECTED NO ANALYTES DETECTED
Semivolatile MS/MSD Analyses		ALL WITHIN LIMITS		LINITS		
Semivolatile Surrogate Recovery	ALL SURROGATES WITHIN LIMITS		ALL SURROGATES WITHIN LIMITS			ALL SURROGATES WITHIN LIMITS
Laboratory Identification Number	15928-77	15928-77MS 15928-77MSD	B0506MSVSLG 15928-108	15928-108MS 15928-108MSD 15928-109 15928-110 15928-111	15928-113 15928-114 15928-116 15928-116 15928-117 15928-119 15928-120	80503HSVSLK 15928-101 15928-102 15928-103 15928-104 15928-105 15928-105
SAIC Sample Number	HETHOO BLANK:SBLKL11 81-1-25	81-1-25 81-1-25	METHOD BLANK:SBLKL12 MW1-12-15	MW1-12-15 HW1-12-15 MW1-12-150UP MW1-13-20 HW1-13-15	MV1-14-15 NV1-14-20 BK-2-15 BK-2-25 BK3-0.5 BK3-5	HETHOD BLANK:SBLKL13 MU1-9-15 MU1-10-15 MU1-10-15 MU1-10-20 MU1-11-15 MU1-11-20

TABLE F-33. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIVOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Tentatively Identified Compounds	Total=5390ug/Kg Total=5300ug/Kg Total=55000ug/Kg Total=46000ug/Kg Total=64000ug/Kg Total=17000ug/Kg	Total=6630ug/Kg Total=10900ug/Kg	Total=14000ug/kg Total=13000ug/kg Total=13000ug/kg Total=5550ug/kg Total=5560ug/kg Total=58000ug/kg Total=5990ug/kg Total=5990ug/kg Total=6050ug/kg Total=6050ug/kg
, slouk falls, soulm DAKOIA (CONTINUED) Significant Sample Results	PHENOL(49), PYR(25J), b3ETHHEXPHTHLT(100B) BENZbELUOR(31JX), BENZkFLUOR(31JX) NAPH(170), 2CH3NAPH(38J) NAPH(1700J), 2CHENAPH(180J) NAPH(750J), 2CHENAPH(180J) NAPH(2400), 2CHENAPH(350J) FLUOR(83), PYR(200), BENZBANTH(180) CHYS(230), BENZbFLUOR(220), BENZKFLUOR(260) BENZBPYR(330), 1N0123cdPYR(180) BENZBPYR(330), 1N0123cdPYR(180)	. b2ETHHEXPHTHLT(50B) b2ETHHEXPHTHLT(58B) 4CH3PHENOL(230).NAPH(700).2CH3WAPH(63)	b2ETHHEXPHTH.T(498) b2ETHHEXPHTH.T(518) b2ETHHEXPHTH.T(518) b2ETHHEXPHTH.T(508) b2ETHHEXPHTH.T(508) b2ETHHEXPHTH.T(508) b2ETHHEXPHTH.T(508) b2ETHHEXPHTH.T(508) b2ETHHEXPHTH.T(508) b2ETHHEXPHTH.T(508) b2ETHHEXPHTH.T(508) b2ETHHEXPHTH.T(508)
Semivolatile Semivolatile Surrogate MS/MSD Recovery Analyses		ALL WITHIN LIMITS	ALL WITHIN LIMITS
Semivolatile Surrogate Recovery	ALL OTHER SURROGATES WITHIN LIMITS NBZ=130		
Laboratory Identification Number	80425NgySL1 15928-83 15928-80 15928-85 15928-86 15928-87	15928-95 15928-95HS 15928-95HSD 15928-100 15928-81	15928-84 15928-89 15928-91 15928-93 15928-94 15928-82 15928-82 15928-96 15928-98 15928-88
	METHOD BLANK:SBLKL4 B3-2-03UP B3-3-03UP B3-3-03UP B3-5-0	MW1-6-150UP MW1-6-150UP MW1-6-150UP MW1-8-20 B3-1-5	B3-2-5 B3-4-5 B3-5-2.5 MM1-5-15 MM1-6-15 B3-2-0 B3-2-0 B3-2-0 MM1-7-15 MM1-7-20 MM1-7-20 MM1-7-20

TABLE F-33. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR SEMIYOLATILE ORGANIC COMPOUNDS AT SOUTH DAKOTA AIR MATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Tentatively Identified Compounds	NONE DETECTED NONE DETECTED TOTAL = \$10,000,11	T01AL=800ug/L	T0TAL=820ug/L	NONE DETECTED NONE DETECTED NONE DETECTED	TOTAL=890ug/L NONE DETECTED NONE DETECTED	NONE DETECTED NONE DETECTED TOTAL=360ug/L	NONE DETECTED NONE DETECTED TOTAL=280ug/L TOTAL = 26ug/L NONE DETECTED NONE DETECTED
	NONE DETECTED NONE DETECTED DIEHTPHTHIT(X)/ADETHHECDHTHIT(X)	NAPH(18)/ACE(2)/FLUOR(2)/FLUORANTH(4) PYR(4)/BENZ(a)/ANTH(2)/CHRYS(2) bZETHHEXPHTHLT(17)/ZMETHNAPH(5)	NAPH(18)/ACE(2)/FLUOR(2)/FLUORANTH(3) b2ethhexphthlT(17)/2methnaph(5)/PYR(3)	bZETHHEXPHTHLT(6) NONE DETECTED bZETHHEXPHTHLT(3)	NAPH(35)/bZETHHEXPHTHLT(4)/ZCH3NAPH(21) bZETHHEXPHTHLT(13) bZETHHEXPHTHLT(11) bZETHEXPHTHLT(4)	NONE DETECTED bZETHHEXPHTHLT(3) NAPH(11)/ACE(7)/DIBENZOFURAN(3)/FLUOR(6) PHEN(9)/ANTH(4)/FLUORANTH(10)/PYR(9) BENZ(a)*WIH(2)/CHRYS(2)/bZETHHEXPHTHLT(3)	NONE DETECTED NONE DETECTED NONE DETECTED NONE DETECTED NONE DETECTED DETECTED DETECTED DETECTED DETECTED DETECTED
ivolatile rogate overy	ALL OTHER SURROGATES ALL WITHIN WITHIN I IMITS		2FP(13)	2FP(0),D5P(0),2BP(3) 2FP(0),D5P(0),2BP(4) 2FP(0),D5P(0),2BP(10)		2FP(18)	ALL OTHER SURROGATES WITHIN LIMITS 2FP(14)
atory ification f	80727MSVWLO 8907065-02MS 8907065-02MS 8907065-02MS		8907065-07	8907065-08 8907065-12 6907065-13	8907065-15 8907065-18 8907065-19 8907065-20	8907065-04RE 8907065-05RE	8907065-09RE 8907065-10RE 8907065-11RE 8907065-14RE 8907065-16RE
SAIC Sample Number	METHOD BLANK (WATERS) FB-3 FB-3MS FB-3MS FB-3 MS FB-3	5H1-4	GW1-4D	GW1-5 GW1-10 GW1-100	G41-12 S4-1 S4-2 S4-3	METHOD BLANK (WATERS) Gul-1 Gul-3	641-6 641-7 641-8 641-11 641-13

TABLE F-34. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR MISCELLANEOUS INORGANICS/ORGANICS
AT SCUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SCUTH DAKOTA

SAIC Sample Number	Laboratory Sample Number	Date Sample Collected	Holding Time Evaluation(a)	Initial Calibration(b)	Continuing Calibration(b)	Initial Calibration Blanks
MATER 68-1 68-5 68-5 68-7 68-7 68-1 MM3-2 MM3-2 MM3-3 MM3-5 MM3-5 MM3-5 MM3-5 MM3-1 MM3-1 MM3-1 MM3-1 MM3-1 MM3-1	15928-1 15928-5 15928-5 15928-6 15928-1 15928-1 15928-1 15928-2 15928-2 15928-2 15928-2 15928-2 15928-2 15928-2 15928-3 15928-3	4/11/89 4/13/89 4/16/89 4/16/89 4/16/89 4/26/89 4/26/89 4/26/89 4/26/89 5/01/89 5/01/89 5/01/89 5/01/89 5/01/89 5/01/89 5/01/89 5/01/89 5/01/89	TPH-54 DAYS TPH-59 DAYS TPH-49 DAYS TPH-49 DAYS TPH-49 DAYS TPH-47 DAYS TPH-47 DAYS TPH-40 DAYS TPH-40 DAYS TPH-30 DAYS TPH-30 DAYS TPH-33 DAYS TPH-34 DAYS TPH-34 DAYS TPH-35 DAYS TPH-37 DAYS TOTAL TOTAL	ALL VITHIN	ALL SITHIN LIMITS	ALL ELEMENTS UNDETECTED
H111-3	15928-32	4/30/89	SULFATE - 37 DAYS CHLORIDE - 37 DAYS BICARBONATE ALKALINITY - 31 DAYS CARBONATE ALKALINITY - 31 DAYS TOTAL ALKALINITY - 31 DAYS PH - 3 DAYS TPH - 37 DAYS			

TABLE F-34. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR MISCELLANEOUS INORGANICS/ORGANICS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIQUX FALLS, SOUTH DAKOTA (CONTINUED)

SAIC Sample Number	Laboratory Sample Number	Date Sample Collected	Holding Time Evaluation(a)	Initial Calibration(b)	Continuing Calibration(b)	Initial Calibration Blanks
HV1-4 HV1-40UP HV1-5 HV1-8 HV1-10 HV1-11 HV1-12	15928-33 15928-34 15928-36 15928-36 15928-39 15928-40 15928-41 15928-41 15928-42	7/30/89 7/30/89 7/30/89 7/30/89 7/30/89 7/30/89 7/30/89 7/30/89	TPH - 34 DAYS			
SOILS B1-1-15 B1-1-25 B1-2-15	15928-76 15928-77 15928-78	4/11/89 4/13/89 4/13/89 4/13/89	TOC - 56 DAYS TOC - 34 DAYS TPH - 53 DAYS TOC - 31 DAYS TOC - 52 DAYS	TOC WITHIN LIMITS TPH XR = 128/104	TPH XR = 112/104	1. TOC <0.1% 2. TOC 0.3% TPH <0.5mg/kg
83-1-0 83-1-5 83-2-000 83-3-000P 83-3-000P 83-3-2.5	15928-80 15928-81 15928-82 15928-83 15928-85 15928-85	68/71/7 68/71/7 68/71/7 68/71/7 68/71/7 68/71/7 68/71/7	TPH - 53 DAYS TOC - 52 DAYS TPH - 53 DAYS			
83-4-0 83-4-5 83-5-0 83-5-2.5	15928-88 15928-89 15928-90 15928-91	4/15/89 4/15/89 4/15/89 4/15/89	TOC - 30 DAYS ALL OK ALL OK TH - 53 DAYS TOC - 52 DAYS			
H41-5-15 H41-5-20 H41-6-15 H41-6-20 H41-7-15	15928-92 15928-93 15928-94 15928-96 15928-96	4/16/89 4/16/89 4/16/89 4/16/89 4/16/89	TOC - 29 DAYS ALL OK ALL OK ALL OK TOC - 51 DAYS TOC - 50 DAYS			

TABLE F-34. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR HISCELLANEOUS INORGANICS/ORGANICS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

MH1-8-15 15928-99 4/17/89 ALL OK MH1-8-15 15928-99 4/17/89 TOC - 28 DAYS MH1-9-15 15928-102 4/17/89 TOC - 28 DAYS MH1-9-15 15928-103 4/12/89 TOC - 28 DAYS MH1-10-15 15928-103 4/12/89 TOC - 28 DAYS MH1-10-15 15928-103 4/12/89 TOC - 28 DAYS MH1-10-15 15928-103 4/12/89 TOC - 19 DAYS MH1-11-2 15928-104 4/12/89 TOC - 19 DAYS MH1-11-2 15928-105 4/12/89 TOC - 19 DAYS MH1-12-15 15928-105 4/12/89 TOC - 17 DAYS MH1-12-15 15928-115 4/12/89 TOC - 17 DAYS MH1-12-15 15928-116 4/12/89 TOC - 17 DAYS MH1	
15928-100	
15928-102	
15928-102	
15928-103	
15928-105	
15928-106	
15928-108	
15928-110	
5   15928-111   4/27/89	
15928-112	
15928-116 4,28/89 10C - 39 DAYS 15928-117 4,28/89 10C - 39 DAYS 15928-118 4,28/89 10C - 39 DAYS 15928-118 4,28/89 10C - 39 DAYS 15928-119 4,28/89 10C - 39 DAYS 15928-119 4,28/89 10C - 39 DAYS 15928-120 4,28/89 10C - 39 DAYS 15928-120 4,28/89 10C - 39 DAYS 17709-02 07,25/89 10C - 17 DAYS 17709-03 07,25/89 ALL OK 17709-07 07,25/89 ALL OK 17709-07 07,25/89 ALL OK 17709-07 07,25/89 ALL OK 17709-10 07,25/89 ALL OK 17709-10 07,25/89 ALL OK 17709-11 07,25/89 ALL OK 17709-12 07,25/89 ALL OK 17709-13 07,25/89 ALL OK 17709-14 07,25/89 ALL OK 17709-15 07,25/89 ALL OK 17709-16 07,25/89 ALL OK 17709-17 07,25/89 ALL OK 17709-18 07,25/89 ALL OK	
15928-117 4,28/89 179H - 4.0 DAYS 15928-118 4,28/89 10C - 35 DAYS 15928-119 4,28/89 10C - 39 DAYS 15928-119 4,28/89 10C - 39 DAYS 15928-120 4,28/89 10C - 39 DAYS 17709-02 07,25/89 10C - 17 DAYS 17709-02 07,25/89 ALL OK 17709-03 07,25/89 ALL OK 17709-04 07,25/89 ALL OK 17709-04 07,25/89 ALL OK 17709-05 07,25/89 ALL OK 17709-10 07,25/89 ALL OK 17709-10 07,25/89 ALL OK 17709-11 07,25/89 ALL OK 17709-12 07,25/89 ALL OK 17709-12 07,25/89 ALL OK 17709-13 07,25/89 ALL OK 17709-14 07,25/89 ALL OK 17709-16 07,25/89 ALL OK 17709-17 07,25/89 ALL OK 17709-18 07,25/89 ALL OK 17709-17 07,25/89 ALL OK 17709-18 07,25/89 ALL OK	
15928-118 4,28/89 10C - 39 DAYS 15928-119 4,28/89 10C - 39 DAYS 15928-120 4,28/89 10C - 38 DAYS 15928-120 4,28/89 10C - 17 DAYS 17709-02 07,25/89 ALL 0K 17709-04 07,25/89 ALL 0K 17709-05 07,25/89 ALL 0K 17709-06 07,25/89 ALL 0K 17709-07 07,25/89 ALL 0K 17709-10 07,25/89 ALL 0K 17709-11 07,25/89 ALL 0K 17709-12 07,25/89 ALL 0K 17709-12 07,25/89 ALL 0K 17709-13 07,25/89 ALL 0K 17709-14 07,25/89 ALL 0K 17709-17 07,25/89 ALL 0K 17709-17 07,25/89 ALL 0K 17709-18 07,25/89 ALL 0K	
15928-120 4,28/89 TOC - 17 DAYS 17709-02 07,25/89 ALL OK 17709-03 07,75/89 ALL OK 17709-04 07,75/89 ALL OK 17709-05 07,75/89 ALL OK 17709-06 07,75/89 ALL OK 17709-09 07,75/89 ALL OK 17709-10 07,75/89 ALL OK 17709-11 07,75/89 ALL OK 17709-12 07,75/89 ALL OK 17709-12 07,75/89 ALL OK 17709-13 07,75/89 ALL OK 17709-14 07,75/89 ALL OK 17709-15 07,75/89 ALL OK 17709-16 07,75/89 ALL OK 17709-17 07,75/89 ALL OK 17709-18 07,75/89 ALL OK 17709-17 07,75/89 ALL OK 17709-18 07,75/89 ALL OK 17709-18 07,75/89 ALL OK 17709-18 07,75/89 ALL OK	
17709-02 07/25/89 ALL OK 17709-03 07/25/89 ALL OK 17709-04 07/25/89 ALL OK 17709-05 07/25/89 ALL OK 17709-09 07/25/89 ALL OK 17709-09 07/25/89 ALL OK 17709-10 07/25/89 ALL OK 17709-11 07/25/89 ALL OK 17709-12 07/25/89 ALL OK 17709-12 07/25/89 ALL OK 17709-12 07/25/89 ALL OK 17709-13 07/25/89 ALL OK 17709-14 07/25/89 ALL OK 17709-15 07/25/89 ALL OK 17709-15 07/25/89 ALL OK 17709-16 07/25/89 ALL OK 17709-17 07/25/89 ALL OK 17709-18 07/25/89 ALL OK 17709-18 07/25/89 ALL OK	
17709-18 07/26/89 ALL 17709-20 07/26/89 ALL 17709-20 07/26/89 ALL	CALIBRATION WITHIN INTERFERENTS VERIFICATION LIMITS DETECTED COMDUCTED

TABLE F-34. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULTS FOR MISCELLANEOUS INORGANICS/ORGANICS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Significant Sample Results	NOT ANALYZED NOT A	TPH 1.4ug/L SULFATE 110 mg/L CHLORIDE 34 mg/L TDS 670 mg/L 1SS 340 mg/L 1SS 340 mg/L TOTAL ALKALINITY 420 mg/L BICARBONATE ALKALINITY 420 mg/L CARBONATE ALKALINITY 420 mg/L PH = 6.9
Duplicate Results(f)	TPH UNDETECTED TPH UNDETECTED	
Spiked Sample Results(e)	CHLORIDE NITRATE SULFATE ALKALINITY ALL WITHIN LIMITS	TSS RPD=3.0 TDS RPD=1.5
MS/MSD Results(d)	TPH WITHIN LIMITS TPH WITHIN LIMITS TPH WITHIN LIMITS	
Method Blank Spikes(c)	LIMITS	
Procedural Blanks	1. TPH 1.1mg/L 2. TPH 0.7mg/L 3. UNDETECTED ALL OTHERS UNDETECTED	
Continuing Calibration Blanks	ALL ELEMENTS UNDETECTED	
Laboratory Sample Number	15928-1 15928-5 15928-6 15928-7 15928-7 15928-10 15928-11 15928-12 15928-21 15928-22 15928-24 15928-25 15928-25 15928-26 15928-26 15928-26 15928-26 15928-26	15928-32
SAIC Sample Number	MATER 68-1 68-5 68-5 68-5 68-5 68-7 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1 68-1	MU1-3

TABLE F-34. LABORATORY QUAL?TY CONTROL CHECK SAMPLE RESULTS FOR MISCELLANEOUS INORGANICS/ORGANICS
AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

Hard   19522-34   Hard   195	SAIC Sample Number	Laboratory Sample Number	Continuing Calibration Blanks	Procedural Blanks	Method Blank Spikes(c)	HS/HSD Results(d)	Spiked Sample Results(e)	Duplicate Results(f)	Significant Sample Results
15928-77 2. 70 0.13/0.13 15928-77 2. 70 0.13/0.13 15928-79 15928-81 15928-81 15928-82 15928-82 15928-82 15928-82 15928-82 15928-82 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928	H1-4 H1-5 H1-5 H1-5 H1-6 H1-9 H1-10 H1-12 H1-12							RPD=36%	TPH 3.3 ug/L TPH 2.3 ug/L TPH=ND TPH 0.6 ug/L TPH 1.1 ug/L TPH=ND TPH=ND TPH=ND TPH=ND TPH=ND TPH=ND TPH=ND TPH=ND TPH=ND TPH=ND TPH=ND TPH=ND
15928-77 15928-78 15928-79 15928-80 15928-81 15928-82 15928-82 15928-82 15928-83 15928-82 15928-83 15928-93 15928-92 15928-93 15928-93 15928-93 15928-93 15928-93 15928-93 15928-93 15928-94 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 15928-95 159	101LS	15928-76	1. 100 0.2%	TPH <20mg/kg	NIHIIN HAL				TOC 0.4% (08)
15928-80 15928-81 15928-82 15928-83 15928-83 15928-83 15928-84 15928-84 15928-89 15928-89 15928-90 15928-91 15928-92 15928-93 15928-93 15928-93 15928-94 15928-94 15928-95 15928-95 15928-95 15928-96 15928-96 15928-96 15928-96 15928-96 15928-96	11-1-25	15928-77 15928-78	2. TOC 0.1%/0.1% TPH <0.5mg/kg		S E				TOC 1.1% (DB) TPH 21 mg/kg TOC 0.9% (DB)
15928-80 15928-81 15928-82 15928-85 15928-86 15928-86 15928-86 15928-89 15928-91 15928-91 15928-92 15928-92 15928-92 15928-92 15928-92 15928-93 15928-94 15928-94 15928-94 15928-95 15928-95 15928-96 15928-96	11-2-25	15928-79							TPH 37 mg/kg TOC 1.1% (DB)
15928-81 15928-82 15928-85 15928-87 15928-89 15928-90 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92 15928-92	3-1-0	15928-80						/	TPH 120 mg/kg TOC 1.7% (0B)
5928-99 5928-91 5928-92 5928-93 5928-94 5928-95 5928-95 5928-95 5928-95 5928-95 5928-95 5928-95	3-1-5 3-2-00 3-3-00 3-3-00 3-3-00 3-3-2.5					TPH XR = 145/143			TPH 30 mg/kg TPH 59 mg/kg TPH 96 mg/kg TPH 34 mg/kg TPH 110 mg/kg TPH 110 mg/kg
5928-90 5928-91 5928-92 5928-93 5928-94 5928-95 5928-95 5928-95 5928-95 5928-95 5928-95 5928-95 5928-95	3-4-5	15928-88 15928-89							100 2.4% (08)
S928-91 S928-92 TPH XR = 136/133 LIMITS S928-94 S928-95 S928-95 S928-95 S928-95 S928-95 S928-95	3-5-0	15928-90							TPH 79 mg/kg TOC 2.0% (DB)
5928-92 TPH XR = 136/133 TPH WITHIN 5928-93 5928-94 5928-95 5928-95 5928-95 5928-95	2-2-5	15928-91						RPD = 0.6	TPH 25 mg/kg TOC 2.2% (0B)
5928-93 5928-94 5928-95 5928-95 5928-96	W1-5-15	15928-92				TPH XR = 136/133		TPH WITHIN	TOC 1.6% (DB)
	W1-5-20 W1-6-15 W1-6-150 W1-6-20	15928-93 15928-94 UP 15928-95 15928-96				100			100 1.6% (01

TABLE F-34. LABORATORY QUALITY CONTROL CHECK SAMPLE RESULIS FOR MISCELLAMEOUS INORGAMICS/ORGANICS AT SOUTH DAKOTA AIR NATIONAL GUARD, JOE FOSS FIELD, SIOUX FALLS, SOUTH DAKOTA (CONTINUED)

salc Sample Kumbar	Sample	Calibration Blanks	Procedural Blanks	Blank Spikes(c)	MS/MSD Results(d)	Sample Results(e)	Duplicate Results(f)	sample Results
441-8-15	15928-98 15928-99 15928-100						RPD = 0.1	10C 1.1% (08)
fu1-9-20 fu1-10-15	15928-102 15928-103							TOC 1.5% (DB)
641-10-150 641-10-20 641-11-15 641-11-20	MAI-10-150015928-104 MAI-11-15 15928-105 MAI-11-20 15928-107	v						TOC 0.9% (0B) TPH 34 mg/kg TPH 190 mg/kg TOC 1.1% (0B)
IN1-12-15 IN1-12-150 IN1-12-20	HUI-12-15 15928-108 HUI-12-150U15928-109 HUI-12-20 15928-110							TPH 730 mg/kg TPH 470 mg/kg TPH 46 mg/kg TOC 1.5% (DB)
KV1-13-15	15928-111				TPH XR = 127/159		TPH WITHIN	
MU1-13-20 MU1-14-15 MU1-14-20 8K-2-15	15928-112 15928-113 15928-114 15928-115						RPD = 0.2	1PH 270 mg/kg 1PH 600 mg/kg 1PH 160 mg/kg 1PH 970 mg/kg 10C 1.2X (0B)
8K-2-20	15928-116				TOC WITHIN			100 1.4% (08)
8K-2-25	15928-117							1PH 31 mg/kg 10C 0.9% (0B)
8K3-0.5 8K3-5	15928-118 15928-119							10C 2.3% (0B) 1PH 86 mg/kg 10C 0.9% (0B)
BK3-20	15928-120				TPH %R = 134/116		TPH WITHIN LIMITS	100 1.1% (08)
FB-3 EB-15 GW1-1 GW1-3 GW1-4 GW1-4	17709-02 17709-03 17709-04 17709-05 17709-06 17709-06	NO INTERFERENTS DETECTED IN 3 BLANKS C	NO INTERFERENTS Detected	NO BLNAK SPIKES CONDUCTED	ALL WITHIN LIMITS	NONE CONDUCTED	RPD= 51%	TPH-ND TPH-ND TPH-0.8 ug/L TPH=1.3 ug/L TPH=2.2 ug/L
11-6-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	17709-09 17709-10 17709-11							171 174 174 174 174 174 174 174 174 174
41-10 11-100 11-100	17709-12 17709-13 17709-14				STIMIT NIBITO TIM		BOTH REPLICATES ND	ON-HOT ON-HOT
125	17709-15							1PH=1.2 ug/L-ND 1PH-ND
u1-14 u-1	17709-17							TPH-ND TPH-ND
×	17709-19 17709-20							Ом-на1 10н-ч0
c) IPH Con d) IPH Con e) Control	(c) PH Control Limits-82-114x (d) FH Control Limits-82-114x (e) Control Limits (2x) Analyte Limits	82-114% 82-114% rol						
Chloride	ide 71-1	333						
Sulfa Alkal	inity 76-1	% %						

# APPENDIX G:

AQUIFIER TEST DATA AND ANALYSES

## AQUIFER TEST ANALYSIS

## INTRODUCTION

An aquifer test was performed at Joe Foss Field in July, 1989. The purpose of this test was to accurately define the properties of the surficial aquifer underlying Site 1 - Underground Fuel Storage Area. Figure 1 illustrates the configuration of the test and observation wells and gives the applicable physical data of the aquifer and the test wells.

Preliminary calculations (Table 1) were performed to predict the impact of the aquifer system characteristics under specified testing parameters. The effects of the following items were estimated:

- 1) Production well storage
- 2) Partial penetration of test wells with aquifer stratification
- 3) Water table decline with delayed gravity yield

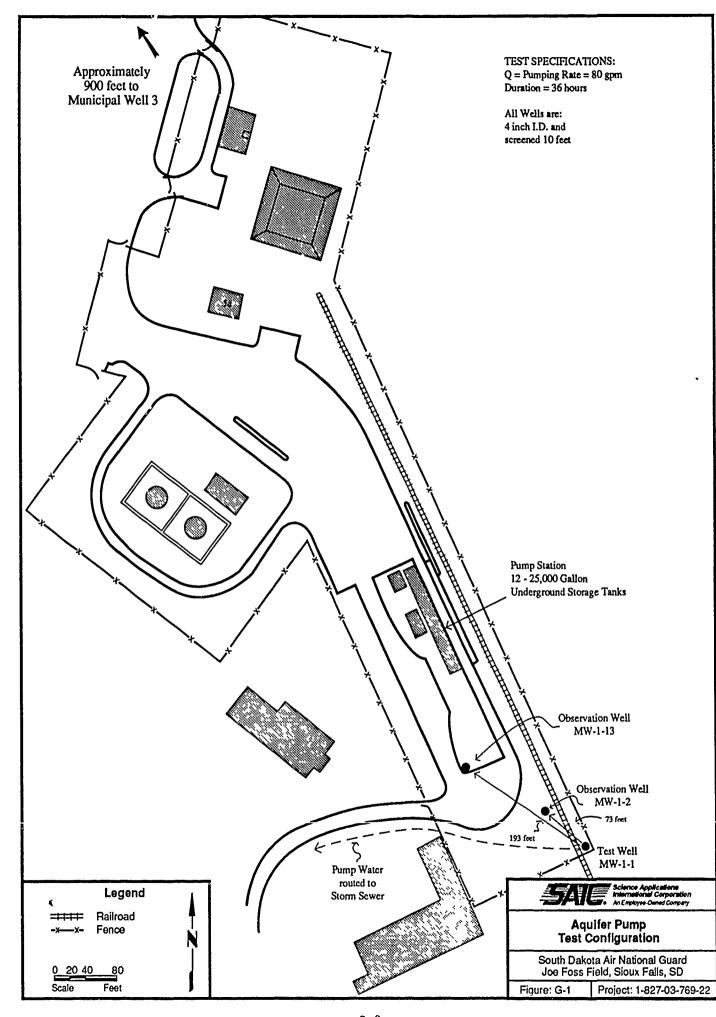
These calculations showed that item 1 was neglible given the specified testing parameters. The effect of item 2 was limited to early drawdown data from the pumping well and would not effect the more important observation well data. The effect of item 3 had to be corrected for early time drawdown data within the observation wells.

The effects of municipal well pumpage or aquifer system boundaries (Big Sioux River, Diversion Channel, pinching out of aquifer to the south) were not assessed during this aquifer testing. As can be derived by the calculation in Table 1, over 8 days of pumping would have been necessary under the specified test parameters to begin noticing their effects on test data.

Prior to testing, antecedent water level trends were monitored for a 24 hour period. No significant trends were noted during this monitoring which would effect test results.

Tests were performed throughout a 4 day period commencing July 27, 1989. Equipment and flow rates were constantly monitored to ensure the maintenance of the defined testing parameters. Water levels were recorded using a Hermit data logger fitted with low range transducers capable of detecting head changes of less than 0.02 feet.

The drawdown vs. time results for only one test and well are presented in Figure 2. The first step in the analysis was to plot these results on logarithmically scaled graph paper. The pumping well data proved to be unusable which is often the case due to turbulance within the well. Plotted data was then matched to a type curve developed by Theis (1935) and the match points of the



# TABLE 1. ASSESSMENT OF AQUIFER EFFECTS ON PUMP TEST DATA

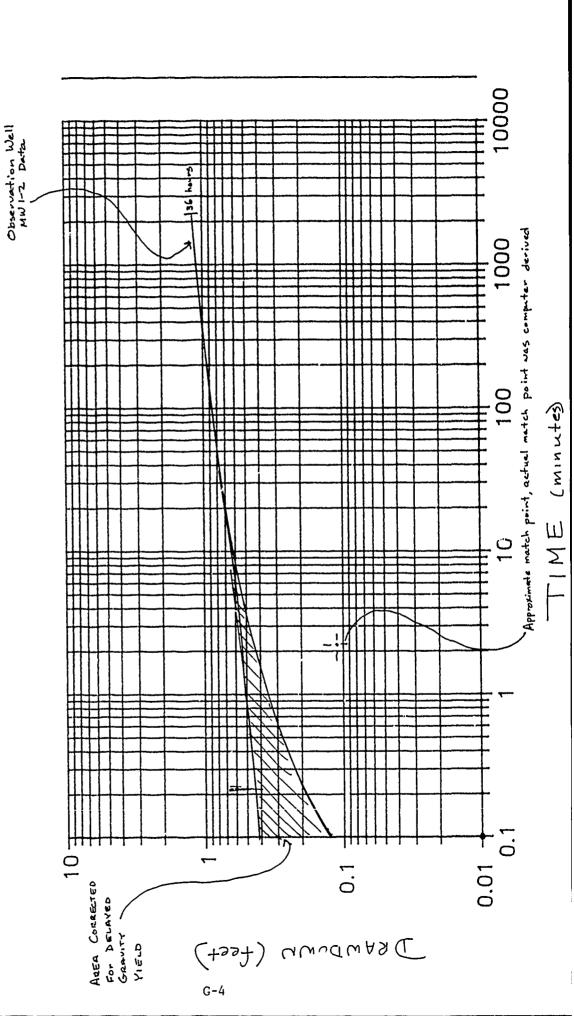
Effect of well storage: ts = time after pumping beyond which well = 1 min. storage has minimal effect Effect of Well Partial Penetration: rp = distance from production well beyond
 which partial penetration impacts are = 42 ft.negligible Effect of Water Table Decline with Delayed Gravity Yield: td = time after pumping beyond which delayed = 91 min. gravity yield is negligible. Time of Pumping Until Boundary Effects are Encountered: = 8.24 days ti = test duration which must be exceeded for boundary effects to be clear where: rw = production well effective radius rc = pump-column pipe radius T = aquifer transmissivity Q = aquifer thickness = 0.5 ft. = 0.125 ft. = 86500 gpd/ft. = 20 ft.

Ph = aquifer horizontal K Pv = aquifer vertical K

boundary image well

Sy = specific yield ri = distance from observation well to = 4500 gpd/ft² = 2250 gpd/ft² = 0.19 = 1000 ft.

FIGURE 2



two curves recorded. Using these match points and the testing parameters, values of Transmissivity (T) and Storativity (S) were calculated using the equations presented in Table 2.

Values of T and S were 86,500 gpd/ft and 0.19, respectively. These values varied by no more than 5% between the different tests performed.

## TABLE 2

Transmissivity and storativity calculations using the modified Theis (1935) non-equilibrium well equations:

 $T = 114.6 Q \cdot W(u)$ 

S

= 114.6 · 80 gal/min · 1

0.106

= 86,500 gpd/ft

Where:

W(u) = 1 = a well function derived
 from an exponential integral
 and is resultant from the
 curve matching technique

Q = 80 gpm = test pumping rate

s = 0.106 = drawdown derived from
the curve matching technique
* Computer derived

 $s = \frac{u \cdot T \cdot t}{1.87 \cdot r^2}$ 

= 0.01 · 86,500 · 2.18

1.87 · (73)2

= 0.19

Where:

u = 0.01 = computer derived match
 point of overlain curves

T = 86.5 = Transmissivity (from above calculations)

t = 2.18 = time derived from curve matching technique * Computer derived

r = 73 = radial distance
 of observation wells to
 test well.

# APPENDIX H:

RISK ASSESSMENT METHODS

# APPENDIX H PUBLIC HEALTH RISK EVALUATION PROCESS

# H.1 INTRODUCTION

Risk Assessment is an essential component of the Remedial Investigation/Feasibility Study (RI/FS) process at hazardous waste sites. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the National Contingency Plan (NCP) require that actions selected to remedy hazardous waste sites be protective of human health and the environment. An overview of risk assessment in the RI/F3 process is presented in the NCP and in the U.S. Environmental Protection Agency (EPA) manual, Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (USEPA 1988b). A baseline risk assessment is conducted as part of the RI to assess site conditions in the absence of remedial actions. As part of the FS process, risk assessment is used to evaluate the acceptability of proposed remedial actions and as a tool in the development of remediation objectives (target cleanup levels).

The public health risk evaluation at the South Dakota Air National Guard (SDANG) Base at Joe Foss Field examines the presence and release of chemicals from the sites under investigation, the observed levels of the compounds in the environment, the potential routes of exposure to human receptors, and the likelihood of adverse health effects following contact with contaminated environmental media. A detailed overview of the assessment methods used is presented in the following discussion. The focus of this evaluation is not an absolute assessment of the risks of exposure to the chemicals present at the sites under investigation. Rather, this evaluation is an appraisal of the relative magnitude of anticipated health problems that may be associated with exposure to chemicals detected at the site. The intention is to determine if there is a significant threat to human health and to assess the need for further site remediation.

## **H.2 OVERVIEW OF METHODS**

The general approach to public health risk evaluation of exposure to chemical contaminants has been well established. The National Research Council prepared a comprehensive overview of the structure of this assessment (NRC 1983) that has become the foundation for subsequent EPA guidance. The *Human Health Evaluation Manual* and the *Environmental Evaluation Manual* (USEPA 1989a,b) provide a detailed presentation of the risk assessment process. These documents are the Agency's key guidance on risk assessment under the Superfund Program. As specified by EPA, the public health evaluation process may be divided into four fundamental component analyses: 1) data evaluation and hazard identification, 2) exposure assessment, 3)

toxicity or hazard assessment, and 4) risk characterization. These analyses are briefly described in the following discussion.

# H.2.1 Data Evaluation and Hazard Identification

The first step in the risk assessment process is to obtain and evaluate all available data on contaminants present at the sites under investigation. The objective is to organize the data into a form appropriate for the baseline risk assessmen. Once the preliminary data set has been obtained and sorted by environmental medium, the following evaluation steps should be completed:

- Evaluate the analytical methods used to determine if results are appropriate for use in quantitative risk assessment
- Evaluate the quality of data with respect to sample quantitation and detection limits
- Examine laboratory qualifiers assigned to monitoring data and evaluate potential quality assurance/quality control (QA/QC) problems
- Evaluate the quality of data with respect to blanks and tentatively identified compounds
- Summarize information on background concentrations of chemicals and compare with observed levels of site-related contamination
- Identify chemicals of potential concern: develop a data set that may be appropriately used in the risk assessment process
- Limit further, if appropriate, the number of chemicals to be used as the subject of the risk assessment process.

From the full listing of all chemicals identified at a waste site or facility, a subset is identified that is of sufficient quality to be used in risk assessment. It may be impractical to evaluate all chemicals that have passed through QA/QC review. Representative "highest risk" compounds may be selected on the basis of 1) quantities present at the site; 2) extent of environmental contamination, toxicity, or hazardousness; and 3) mobility and persistence of the chemical in the environment. This final step is specified as optional by EPA, and does not improve the quality or accuracy of the risk assessment. The step is suggested as a device for facilitating the risk assessment process when time and resources prohibit the evaluation of the full (and often complex) data set.

# H.2.2 Exposure Assessment

# H.2.2.1 General Approach

The objectives of the exposure assessment are to 1) delineate exposure pathways; 2) identify receptors at maximum risk; and 3) measure or estimate for each receptor the intensity, duration, and frequency of the exposure. Critical to the exposure assessment is a quantification of the

releases of contaminants of concern to each environmental medium (from all sources at the waste site) and an assessment of the transport and transformation of the subject compounds. The results of these analyses provide data on the magnitude and extent of contamination. Both monitoring data and environmental transport modeling typically are used in the exposure assessment.

In a public health risk assessment of hazardous waste sites, exposure pathways that may be identified include ingestion of contaminated groundwater or surface water, ingestion of soil or inhalation of contaminated soil particulates, dermal contact with contaminated soil or water, and inhalation of volatile compounds. The ingestion pathway is the exposure route of primary concern in the assessment of waste sites at SDANG. Dose estimates (in mg/kg/day) are developed for each chemical of concern. Estimates of dose are needed in the risk characterization and are generally determined as follows:

Dose = 
$$C \times \frac{CR \times EFD \times ABS}{BW \times AT}$$
 (1)

where:

C = Chemical concentration in the environmental medium under evaluation

CR = Contact rate; the amount of contaminated medium contacted per unit time or

event

EFD = Exposure frequency and duration; how long and how often exposure occurs

ABS = Absorption factor

BW = Body weight; the average over the exposure period

and

AT = Averaging time; the period over which exposure is averaged.

Equation (1) is used to derive estimates of subchronic or chronic dose (lifetime assumed to be 70 years). The chronic dose estimate based on mean concentrations in environmental samples (arithmetic mean) was used as the basis of the risk characterization at all sites under investigation.

# H.2.2.2 Comparison with Applicable or Relevant and Appropriate Requirements

Once the baseline concentrations of subject chemicals have been determined at the waste sites, these levels are compared to applicable or relevant and appropriate requirements (ARARs). CERCLA as amended by the Superfund Amendments and Reauthorization Act of 1986 requires the selection of remedial actions at Superfund hazardous waste sites that are protective of human health and the environment, cost-effective, and technologically and administratively feasible. Section 121 of CERCLA specifies that response action must be undertaken in compliance with ARARs established in Federal and State environmental laws.

In the revised NCP (USEPA 1988c) and CERCLA Compliance With Other Laws Manual (USEPA 1988), several different types of requirements are identified with which Superfund remedial actions must comply: 1) ambient or chemical-specific requirements, 2) action-specific requirements, and 3) location-specific requirements. Because situations at CERCLA sites vary widely, EPA cannot categorically specify requirements that will be ARARs for every National Priority List site. ARARs can only be identified on a site-specific basis (i.e., established in connection with the characteristics of the particular site, the chemicals present at the site, and the remedial alternatives suggested by the circumstances of the site).

EPA has specified that the different ARARs that may apply to a site and its remediation should be identified and considered at several points in the remedial planning process (USEPA 1987), as delineated below:

- During scoping of the RI/FS, chemical- and location-specific ARARs may be identified on a preliminary basis.
- During the site characterization phase of the RI when the baseline public health evaluation is conducted to assess the risk at a given site, the chemical-specific ARARs and advisories and location-specific ARARs are identified more comprehensively and used to help determine cleanup objectives.
- During the development of remedial alternatives in the FS, action-specific ARARs are identified for each proposed remedial alternative and are considered along with other ARARs and advisories.
- During the detailed analysis of alternatives, all ARARs for each proposed remedial action
  must be examined to establish the appropriate level of protection and to comply with other
  environmental laws.
- In selecting the most appropriate alternative, the remedial action chosen must be able to attain all ARARs, unless one of the six statutory waivers is invoked.
- During remedial design, the technical specifications of construction must comply with appropriate ARARs (primarily action-specific).

In the RI/FS process, the evaluation of remedial alternatives must consider effectiveness, implementability, and cost. Within the context of the effectiveness evaluation, chemical-specific ARARs assume major significance. Each alternative is evaluated with regard to effectiveness in protecting human health and the environment. Effectiveness criteria include protectiveness and the envisioned reduction of toxicity, mobility, or volume through treatment.

According to the guidance presented in the revised NCP, protectiveness (i.e., the ability to protect human health and the environment) means that a given remedial alternative meets or exceeds ARARs or other risk-based levels established through a risk assessment when ARARs do not exist

or are waived. In the NCP and in the guidance manual on CERCLA compliance with other laws (USEPA 1988c, USEPA 1988a, USEPA 1989d), EPA specifies that when ARARs are not available for a given chemical or where such ARARs are not sufficient to be protective, health advisory levels should be identified or developed to ensure that a remedy is protective. For carcinogenic effects, these health advisory or cleanup levels are to be selected such that the total risk of all contaminants falls within the acceptable range of 10⁻⁴ to 10⁻⁷. Although the 10⁻⁶ risk level is identified by EPA as a "point of departure" in evaluating the results of risk assessment, the revised NCP clearly indicates that the 10⁻⁴ level is the upper bound of the acceptable range (USEPA 1988c). In cases where noncarcinogenic effects are a concern, EPA specifies that cleanup should be based on acceptable levels of exposure, as determined by the EPA reference doses (RfDs), taking into account the effects of multiple contaminants and multiple exposure pathways at the site.

Therefore, chemical-specific ARARs serve two primary purposes: 1) requirements that <u>must</u> be met by a selected remedial alternative (unless a waiver is obtained) and 2) as a basis for establishing appropriate cleanup levels. The public health risk assessment of a given remedial action alternative characterizes the actual risk of exposure of human receptors to contaminants under investigation. For carcinogens, risk characterization yields a probable estimate of the additional lifetime risk of cancer in the exposed individual or the incidence of new cases of cancer in populations. For noncarcinogens, exposure levels or doses for all subject compounds are evaluated to determine levels or doses if these exceed EPA RfDs. When an ARAR is available for all subject compounds of concern and the ARARs are determined to be protective, these requirements become the chemical-specific cleanup goals. As noted previously, however, when ARARs are found not to be protective or are not available, the results of the risk assessment (i.e., health advisory levels) are used to establish the more stringent target cleanup goals.

Thus, the requirement that a remedial alternative meet chemical-specific ARARs does not ensure that the proposed alternative is protective and thereby potentially acceptable. This can be determined only by 1) evaluating the combined carcinogenic risk associated with the ARAR limits for all chemicals at a given site (assuming additivity of effect in the absence of data on synergism or antagonism), 2) establishing that ARARs do not exceed EPA RfDs for noncarcinogenic effects and are sufficiently protective when multiple chemicals are present, 3) determining whether environmental effects in addition to human health considerations are adequately addressed by the ARARs, and 4) evaluating whether the ARARs adequately cover all significant pathways of human exposure identified in the baseline risk assessment. The EPA Human Healtn Evaluation Manual

(USEPA 1989a) provides guidance on evaluating multiple exposure to chemicals (carcinogenic and noncarcinogenic effects) and on establishing acceptable exposure levels when no ARARs exist.

# H.2.3 Toxicity Assessment

The objectives of the toxicity or hazard assessment are to evaluate the inherent toxicity of the compounds under investigation and to identify and select toxicological measures for use in evaluating the significance of the exposure. When developing these toxicological measures, available dose-response data are reviewed on the adverse effects to human and nonhuman receptors. Dose-response assessments for noncarcinogens provide an estimate of the no-observable-adverse-effect level (NOAEL) or lowest-observable-adverse-effect level (LOAEL). For carcinogenic compounds, the dose-response assessment yields estimates of probability or range of probabilities under which a carcinogenic effect will occur at a specified level of exposure.

In conducting an assessment of risk of exposure to chemicals released from waste sites, several toxicity measures of importance may be identified:

- RfDs for oral exposure Acceptable intake values for subchronic and chronic exposure (noncarcinogenic effects)
- RfDs for inhalation exposure Acceptable intake values for subchronic and chronic exposure (noncarcinogenic effects)
- · Carcinogenic potency factors for oral exposure
- Carcinogenic potency factors for inhalation exposure.

The RfDs and potency factors for oral exposure are the toxicity measures needed in the assessment for SDANG. Long-term (i.e., chronic) exposure and health risk is the focus of the evaluation at all sites.

The primary sources of information for these data are the Integrated Risk Information System (IRIS) data base and the EPA Office of Research and Development (ORD) Health Effects Assessment Summary Tables (USEPA 1989c). The IRIS is a computer-housed catalog of EPA risk assessment and risk management information for chemical substances. Data in the IRIS system is regularly reviewed and updated by EPA. The Superfund Public Health Evaluation Manual (1986a) is used as a secondary source of information only.

# H.2.4 Risk Characterization

The last step in the baseline public health evaluation is risk characterization. This is the process of integrating the results of the exposure and hazard (toxicity) assessment (i.e., of comparing estimates of dose with appropriate toxicological endpoints to determine the likelihood of adverse effects in exposed populations). It is common practice to consider risk characterization separately for carcinogenic and noncarcinogenic effects because of a fundamental difference in the way organisms typically respond following exposure to carcinogenic or noncarcinogenic agents. For noncarcinogenic effects, toxicologists recognize the existence of a threshold of exposure below which there is only a very small likelihood of adverse health impacts in an exposed individual. Exposure to carcinogenic compounds, however, is not thought to be characterized by the existence of a threshold. Rather, all levels of exposure are considered to carry a risk of adverse effect.

The procedure for calculating risk associated with exposure to carcinogenic compounds has been established by EPA (USEPA 1986b,c; UESPA 1989a). A nonthreshold, dose-response model is used to calculate a carcinogenic potency factor (which mathematically is the slope of the dose-response curve) for each chemical. To derive an estimate of risk, the carcinogenic potency factor (q1* - defined in the following equation) is then multiplied by the estimated chronic daily dose experienced by the exposed individual:

$$R = D \times q1^* \tag{2}$$

where:

D = Chronic daily dose (mg/kg body weight/day)

and

q1* = 95% upper-bound estimate of the slope of the dose-response curve [(mg/kg body weight/day)-1].

R is an explicit estimate of excess lifetime risk having a value between 0 and 1 and expresses the additional probability that an individual will develop cancer over a lifetime of exposure at the specified dose level. In evaluating risk of exposure to more than one carcinogen, the risk measure (R) for each compound may be summed (in the absence of information on antagonistic or synergistic effects) to provide an overall estimate of total carcinogenic risk (USEPA 1986a,b). This is conducted for each source of environmental release, associated exposure pathway, and receptor group at risk of exposure. Population risks are derived by multiplying the overall risk level (summed for all subject chemicals) by the number of people exposed. This would yield a measure of the additional incidence of developing cancer (i.e., additional number of new cases) in the exposed population over a lifetime (i.e., 70 years) of exposure.

Equation (2) is recommended only for quantifying estimated carcinogenic risk levels < 1 x  $10^{-2}$  (USEPA 1989a). Where exposure/dose for carcinogens is high and the combined risk exceeds  $10^{-2}$ , an alternate model is recommended by EPA for quantifying lifetime risk, as follows:

$$R = 1-\exp(-D \times q1^*).$$
 (3)

The traditionally accepted practice of evaluating exposure to noncarcinogenic compounds has been to experimentally determine a NOAEL, then divide it by a safety factor to establish an acceptable human dose, for example, acceptable daily intake or RfD (USEPA 1989a). The RfD is then compared to the average daily dose experienced by the exposed population to obtain a measure of concern for adverse noncarcinogenic effects:

$$HQ = D/RfD \tag{4}$$

where:

HQ = Hazard quotient: potential for adverse noncarcinogenic effects

D = Average daily dose for subchronic or chronic exposure (mg/kg body weight/day)

and

RfD = Acceptable intake for subchronic or chronic exposure (mg/kg body weight/day).

If the HQ is greater than 1, the potential may exist for adverse noncarcinogenic effects at the given exposure/dose level. Final guidelines for evaluating exposure to mixtures of noncarcinogens is presented by EPA (1986b). Essentially, this involves summing the HQs (ratios of daily dose/RfD) for all chemicals under evaluation to form a hazard index (HI). If the sum of these ratios (HI) is greater than 1, the potential exists for adverse noncarcinogenic effects. Under these circumstances, EPA recommends segregating the compounds into groups of like or common toxicological effects and again to evaluate the potential for manifestation of the various adverse health effects identified.

# H.3 METHODS FOR EQUILIBRIUM PARTITIONING ANALYSIS OF SOIL CONTAMINATION

An approach has been adopted for evaluating the potential health significance of observed levels of contamination in subsurface soils at SDANG. An equilibrium partitioning approach 1s adopted to estimate the concentration of site-related contaminants in soil pore water that correspond

to the measured concentrations of chemicals in the soil matrix. An extremely conservative risk estimate is then developed by projecting the potential for adverse health effects associated with hypothetical exposure to the soil pore water. The concentration of chemicals in the aquifer beneath the site could never exceed the projected concentrations in pore water. Given the effects of dilution, attenuation, and transformation, the groundwater levels are likely to be orders of magnitude less than the projected pore water concentrations.

The relationship between the amount of a chemical absorbed on soil and the equilibrium concentrations in soil pore water may be expressed using the Freundlich Isotherm, as follows (Lyman 1982):

$$C_{S} = K \times C_{pw}^{1/n}$$
 (5)

where:

C_s = Concentration of a given chemical in soil (mg/kg)

 $C_{pw}$  = Concentration of the chemical in pore water (mg/L)

K = Soil-water distribution coefficient (liters/kg)

and

n = Constant for a given chemical.

Equation (5) is most appropriately used for nonionizing organic chemicals. For this class of compounds, it is possible to express the tendency of a compound to be absorbed in terms of a parameter  $K_{oc}$  (the organic carbon-water equilibrium partition coefficient), which is largely independent of the properties of the soil itself.

$$K = (K_{oc}) \times (f_{oc}) \tag{6}$$

where:

 $K_{oc}$  = Organic carbon-water equilibrium partition coefficient (liters/kg)

and

 $f_{oc}$  = Fraction of organic carbon in soil (unitless).

In this screening level assessment, the value of n may be approximated at unity (1.0) for the nonionizing organic chemicals. The linear Freundlich equation may then be combined with the expression for the distribution coefficient (K) to yield:

$$C_{pw} = C_s/K_{oc} \times f_{oc}. \tag{7}$$

Equation (7) above is used to project the equilibrium concentration of a chemical in soil pore water  $(C_{pw})$  that would correspond to the concentration in the soil matrix. A value of 0.02 (2 percent) has been adopted as the fraction organic carbon content for soils at the Base (based on the results of site sampling and analysis).

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- U.S. Environmental Protection Agency. 1989c. Health Effects Assessment Summary Tables Third Quarter FY 1989. EPA, Office of Research and Development. Washington, DC.
- U.S. Environmental Protection Agency. 1989d. CERCLA Compliance With Other Laws Manual, Part II. EPA, Office of Emergency and Remedial Response. Washington, DC.

# APPENDIX I:

BIOGRAPHIES OF KEY PERSONNEL

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## MAMIE S. BROUVER

#### **EDUCATION**

University of California, Berkeley: B.A., Botany, 1981 University of San Francisco: M.S. Candidate, Environmental Management

#### SHORT COURSES

1984 Capillary Column Chromatography - Hewlett-Packard, Sunnyvale, CA 1985 Principles of Gas Chromatography - Varian Corporation, San Ramon, CA

#### SUMMARY OF EXPERIENCE

Ms. Brouwer is an Environmental Scientist with SAIC's Environmental Technology Group in the Applied Technology Division. She has 7 years of professional experience as an environmental analytical chemist and laboratory program manager.

Ms. Brouwer's work in environmental chemistry has included developing integrated laboratory and field Quality Assurance Project Plans for the USAF Installation Restoration Program (IRP), IRP analytical data review, and analytical specifications review for bids and proposals.

As a Laboratory Program Manager for Clayton Environmental Consultants in Pleasanton, California, Ms. Brouwer served as the technical supervisor for the laboratory's commercial clients. Her responsibilities included communication with the project manager and laboratory staff, review of the technical soundness of the project analysis scheme, analytical data review, and final report preparation. Ms. Brouwer was also responsible for proposal preparation and business development. Key clients included chemical manufacturers, research and development facilities, and environmental consulting firms. Two investigations were located at sites on the National Priority List. Ms. Brouwer also has developed laboratory analytical programs modeled after the U.S. EPA's Contract Laboratory Program (CLP) for nonregulatory clients.

As a Chemist II, Ms. Brouwe, served as the Senior Chemist and Gas Chromatography Section Leader. She was responsible for the supervision of two chemists and the operation of nine gas chromatographs. Daily responsibilities included analyst and instrumentation scheduling, instrument maintenance and operation, section quality assurance/quality control, data review, and method development. Volatile halocarbon and aromatic hydrocarbon, organochlorine and organophosphorus pesticide, and petroleum hydrocarbon analyses were conducted most frequently in the Chromatography Section.

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As a Technician III with Engineering-Science, Inc. in Berkeley, California, Ms. Brouwer was responsible for metals preparation and analysis using Atomic Absorption Spectrophotometry and pesticide and herbicide sample preparation and analysis using Gas Chromatography.

Ms. Brouwer's Master Thesis concerns the deposition of DDT and its metabolites in sediments located in an agricultural drain near Salinas, California.

## PROFESSIONAL AFFILIATION

American Chemical Society

#### EMPLOYMENT HISTORY

Science Applications International Corporation November, 1987 - Present

Clayton Environmental Consultants, Inc. February, 1983 - September, 1987

Engineering - Science, Inc. October, 1980 - February, 1983

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# JOHN R. CARTER, III

## EDUCATION:

Virginia Polytechnic Institute and State University: B.S., Geophysics (1985)

Minor: Applied Engineering Mathematics

Texas Tech University: Field Study, Salida, Colorado (1985)

#### SUMMARY OF EXPERIENCE:

Mr. Carter is a staff geophysicist/geologist within the Environmental Technology Group (ETG) of Science Applications International Corporation (SAIC). joining SAIC, he has provided technical support and field management for projects under the Department of Defense (DOD) Installation Restoration Program (IRP) as well as the Superfund Innovative Technology Evaluation (SITE) program. Carter also assists in the management and operation of SAIC's Equipment Service Center which is responsible for the allocation, tracking, and maintenance of all equipment for ETG field projects. Mr. Carter has recently completed an eighthour Environmental Protection Agency (EPA) required health and safety refresher course in addition to an SAIC health and safety course for managers and supervisors.

# Department of Defense Installation Restoration Program

Mr. Carter has played an active role in all phases of the Installation Restoration Program (IRP). This program determines the degree and extent of environmental degradation associated with past waste handling practices. He has assisted in the issuance of subcontractor contracts, planned and extensively participated in field projects, and co-authored reports.

Most recently, Mr. Carter served on the field crew conducting Site Investigation (SI) activities at Toledo ANGB, Swanton, Ohio. He was responsible for the installation and development of all well points and assisted in a groundwater probe survey.

Mr. Carter served as the supervisory field geologist/manager during the installation of bedrock groundwater monitoring wells at the Niagara Falls ANGB, Niagara Falls, N.Y. This position required supervision of the installation, development, soil sampling, and all employees involved with this phase of the project. Mr. Carter also served as the co-field manager during the groundwater sampling of all on-base monitoring wells and was responsible for the collection of all surface water/sediment samples.

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Mr. Carter has been a part of IRP activities at a number of installations: Toledo ANGB, Ohio; Niagara Falls ANGB, New York; Joe Foss Field ANGB, South Dakota; Hancock Field ANGB, New York; and McEntire ANGB, South Carolina. He has gained the following skills from his extensive field work at these sites: supervision of hollow stem auger, mud and air rotary drilling operations, and soil borings, installation of shallow/deep groundwater monitoring wells, subsurface sampling using a standard split-spoon, Shelby tube and California ring samplers, monitoring well development and purging, surface water/stream discharge/flow measurements, aquifer characterization and drum sampling. Carter has also participated int the sampling of soils, surface water, sediments and groundwater and their handling and shipment.

Mr. Carter has also been involved in the writing of reports associated with the IRP. His responsibilities have included: assimilation, review and analysis of field and analytical laboratory data; assessment and characterization of associated geologic and hydrogeologic conditions, and review and revision of IRP documents. Currently Mr. Carter is assisting in the writing and production of the Remedial Investigation Final Report for Joe Foss Field ANGB, South Dakota.

# Superfund Innovative Technology Evaluation (SITE) Program

Mr. Carter provided support to a U.S. Environmental Protection Agency (EL .. SITE project conducted in New Bedford, Massachusetts. This project dealt with the clean-up of PCB-contaminated ocean sediments. His responsibilities included field data assimilation and analysis. Mr. Carter also contributed technically to the final report associated with this project.

In addition, Mr. Carter co-manages the ETG Equipment Service Center. He assisted in the development of a tracking system for this program and an associated data base to maintain and ensure operation of over 200 pieces of necessary environmental/safety equipment. Mr. Carter has also revised company-wide Standard O perating Procedures (SOP) for hazardous waste field work.

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## J. ERIC GIBSON

## **EDUCATION**

University of Delaware, Bachelor of Science, Geology, (1984) George Washington University, Masters Level Hydrogeology Course, (1986)

## **EXPERIENCE**

Mr. Gibson is a Supervisory Geologist with over four years experience conducting and managing a wide variety of hazardous waste related tasks. This experience has encompassed all four phases of the CERCLA/SARA PA/SI/RI/FS process and ranges from conducting Preliminary Assessments (PA) at a variety of sites to designing and performing a multitude of Site Inspections (SI) and Remedial Investigations (RI) to designing and implementing pilot-scale remedial actions related to Feasibility Studies (FS). He has used this "hands-on" experience to evaluate a number of RCRA compliance documents.

Currently, Mr. Gibson is Remedial Investigation manager at two Installation Restoration Projects (IRP) for the Air National Guard. His responsibilities in these investigations, which are located in Colorado and South Dakota, include RI Work Plan development and costing; acquisition of any subcontractors; technical and financial management of all field work; and performing and managing the data evaluation and project report writing. In this capacity he is also responsible for aiding in the design and implementation of remedial actions evaluated and selected during the FS which has recently included a pilot-scale test of the use of an air stripper at a hydrocarbon spill site on one of the above projects.

Gibson is familiar with all aspects of investigating hazardous waste sites and has been developed during past involvement with IRP, EPA Superfund, and research and development projects while serving in the capacity of either RI Manager, Field Operations Manager, or Site Geologist. This experience is broad and varied because these studies have been conducted in a wide variety of environmental and hydrogeologic settings including sites in Alaska, California, Colorado, Delaware, Idaho. Illinois, Louisiana, Missouri, New Jersey, New York, South Carolina, South Dakota, Texas, and Utah. He is experienced with a multitude of different field data collection methods including soil gas and probe surveys; soil boring, lysimeter, and monitoring well groundwater installation; terrain conductivity, resistivity, magnetometer, and seismic refraction and reflection geophysical techniques; slug testing, step-drawdown and constant rate pump test aquifer testing methods; sampling a

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variety of different environmental media; and field lab analyses and on-site gas chromatography for on-site chemical analyses. All of these methods were employed while adhering to EPA guidelines and protocols and appropriate QA/QC measures. He is also experienced in evaluating the data from these methods using both conventional and computer-assisted techniques in order to characterize site contamination and hydrogeology.

His knowledge and experience was recently used during bedrock well packered-interval sampling and testing at the Stringfellow Acid Pits Superfund Site in California. This field project was designed to provide potentiometric head, hydrogeologic property, and chemical data which would give insight to the flow regime within the bedrock fractures and the importance in the transport of contamination beneath, around, and downgradient of the site. Mr. Gibson's responsibilities, while serving as Field Operations Manager, included work plan development, packer design, and the supervision of all site field work including QA/QC and health and safety requirements.

He has also participated in an in-situ bioreclamation research project at a contaminated site location on Kelly Air Force Base, Texas. This research project was intended to enhance the microbial degradation of organic contaminants through the controlled injection of microbe proliferating nutrients. His responsibilities in this remedial action research project consisted of: system operation (control and planning of the pumping and injection rates of both circulated groundwater and microbial nutrients); groundwater sampling; supervision of subcontractor personnel; sampling of contaminated soils obtained by drilling equipment while employing sterile sampling techniques; and field analysis of soil and groundwater chemical parameters.

Also, Mr. Gibson was previously employed by Delmarva Drilling Company of Bridgewille, Delaware. As a member of the drilling group, he assisted with all facets of water well installation and evaluation. His responsibilities include: logging and installation of groundwater producing and monitoring wells; conducting water well pumping and slug tests used in the determination water well and aquifer parameters; recommendations concerning water well location and design; and data interpretation.

Mr. Gibson was a research assistant for the Geology Department of the University of Delaware, during the summer of 1984. In this capacity, he assisted in the investigation of the geological and environmental characteristics of a coastal area experiencing rapid erosion in Central Delaware. He was responsible for flowmeter installation; collection of sediment samples; surveying of the coastal zone; determining the location of sediment sources; and preparation of reports.

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J. ERIC GIBSON

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# PROFESSIONAL AFFILIATIONS

National Water Well Association

# **PUBLICATIONS**

Installation Restoration Program Phase II - Confirmation/Quantification, State 1, Final Report for Charleston Air Force Base (Co-authored with E. Repa, et. al.); for U.S. Air Force, OEHL, Brooks AFB, Texas, (1986).

Installation Restoration Program Phase II - Confirmation/Quantification, State 1, Final Report for Charleston Air Force Base (Co-authored with J. Mentz, et. al.); for U.S. Air Force, OEHL, Brooks AFB, Texas, (1987).

Installation Restoration Program Phase II/IVA - Site Characterization Report for Gowen Field, Boise, Idaho; for the Air National Guard Service Center, Andrews AFB, Maryland (1987).

Installation Restoration Program - Site Inspection Report for Joe Foss Field, Sioux Falls, South Dakota; for the Air National Guard Service Center, Andrews AFB, Maryland (1988).

Verified for accuracy by: A. Euc Milson Date: 4-7-89



#### **EDUCATION**

Virginia Polytechnic Institute and State University: M.S., Environmental Engineering (1986)

University of Pittsburgh: B.S., Environmental Science (1977)

#### SUMMARY OF EXPERIENCE

Ms. Samson is a project manager and environmental engineer with SAIC's Waste Management Technology Department. She has more than 9 years of technical experience, ranging from design of water, wastewater, and hazardous waste treatment systems to evaluation and analyses of wastewater and soils. She has managed and provided engineering support for Superfund and the Department of Defense Installation Restoration Program (IRP) remedial investigation/feasibility study (RI/FS) projects. She also is familiar with Resource Conservation and Recovery Act (RCRA) regulations and permitting procedures. She has managed quality control/quality assurance (QA/QC) procedures and directed product research and development for a chemical manufacturing facility. She also has experience in field investigation activities, including groundwater monitoring well installation, environmental sampling to include groundwater, surface water, stream sediments, and soils and has planned and supervised treatability studies for the design of groundwater treatment systems.

#### EMPLOYMENT HISTORY

March 1985 to present: Science Applications International Corporation (SAIC)

Currently, Ms. Samson is managing an RI/FS study for the South Dakota Air National Guard at Joe Foss Field as part of the Department of Defense Installation Restoration Program (IRP). She is directing the field investigation of contaminated soils and groundwater from underground storage tanks and a fire training area. Ms. Samson also is managing the evaluation of remedial action alternatives for the contaminated sites and implementation of interim remedial actions for treatment of the contaminated groundwater at Joe Foss Field. Treatability studies for evaluating the performance of an air stripper for treatment of the groundwater were planned and Currently, she is managing the closure conducted under her direction. plans for twelve underground storage tanks, also at Joe Foss Field. the Air National Guard, Ms. Samson also was the engineering operations manager for Gowen Field ANGB in Idaho. Her responsibilities included evaluation of the hazardous waste sites on the base to determine if remedial actions were necessary. In addition to her project management duties, she provides technical support and serves in a review capacity for various other IRP projects which include planning RI field and data collection activities, data evaluation, and development and evaluation of remedial action alternatives through feasibility studies. Ms. Samson also assists

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Connie Durst Samson



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in the development and review of project work plans, quality assurance project plans, sampling and analysis plans, and project health and safety plans.

For SAIC, Ms. Samson assisted with various RI/FS programs in conjunction with the Superfund program. She provided engineering support for the RI/FS of a top priority Superfund site. Her responsibilities included detailed investigation of previous remediation efforts and engineering evaluation of on-site treatment techniques and removal options for both contaminated soils and groundwater.

Ms. Samson assisted with an RI/FS of the Rockaway Borough Well Field, a contaminated aquifer site on the CERCLA National Priorities List. responsibilities included developing candidate remedial alternatives and identifying the most cost-effective method for treating the contaminated groundwater aquifer which supplied potable water for the community.

For the EPA, Ms. Samson contributed to the design and operations management of an in situ biological treatment system at an Air Force site. The groundwater and subsurface soils at the site were contaminated with solvents, jet fuels, and plating wastes. The bioreclamation project was implemented by the injection of hydrogen peroxide and nutrients to enhance microbial degradation of the wastes. Ms. Samson assisted with the design of the injection and recovery system and developed a biological and chemical monitoring program to assess system operation and performance and evaluate treatment success. In addition, she was responsible for data analysis, field operations, and project engineering.

Ms. Samson participated in SAIC's research effort to develop solids separation equipment for the separation of dredged contaminated sediments by level of contamination. The research effort was conducted for EPA and the U.S. Coast Guard to evaluate methods to potentially reduce the cost of treatment and disposal of contaminated sediments. She was a major contributor to the development of a laboratory research study and pilot-scale equipment testing procedures. The laboratory study was designed to examine the distribution of organic and inorganic contaminants in both the grain size and organic fractions of contaminated sediments. Pilot-scale equipment testing was designed to evaluate separation efficiencies of various types of equipment.

Under the RCRA Implementation Program, Ms. Samson has become familiar with hazardous waste regulations and has participated in various aspects of the Program. She has reviewed RCRA Part B permit applications for completeness and technical deficiencies and formulated comments to direct the applicant in providing the necessary information in order to acquire RCRA permits. In addition, Ms. Samson has served as a member of Part B permit review

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Connie Durst Samson



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QA/QC teams and has evaluated applications to meet the RCRA requirements under the Hazardous and Solid Waste Amendments of 1984. Ms. Samson has conducted RCRA Facility Assessments (RFAs), including preliminary reviews of files, visual site inspections, and as a member of environmental sampling teams. These activities have included identification of solid waste management units, evaluation of potential environmental releases from the units, review and evaluation of facility hazardous waste management practices, and acquisition of environmental samples for chemical analyses.

## April 1984 to September 1984: Olver Incorporated

While employed as a project engineer for Olver Incorporated, Ms. Samson contributed to the design of a municipal collection and treatment system for handling wastewater. The system included primary treatment, secondary activated sludge treatment, and anaerobic digestion of waste solids. also assisted with modifications and upgrade of a municipal water distribution and treatment system. Responsibilities included hydrant testing for pressure and flow rates, and pump, piping, and auxiliary equipment design and selection.

For private clients, Ms. Samson has gained experience in hazardous waste treatment system design, treatability studies, delisting petitions, facility closure plans, and RCRA Part B permit applications. She assisted with the design of a hazardous waste treatment system for an electric arc furnace steel production facility. Treatability studies were conducted under her direction to determine the most feasible method of rendering the waste material nonhazardous. She also was responsible for submitting a delisting petition to EPA for the treated nonhazardous waste. Facility closure plans for hazardous waste storage piles and surface impoundments were submitted under her direction for a steel production facility and a manufacturer of friction products. She is familiar with RCRA Part B permitting procedures. Experience in this area was gained by assisting with a permit application for a friction products manufacturing facility.

Virginia Polytechnic Institute and State September 1983 to June 1984: University

While attending graduate school at Virginia Polytechnic Institute and State University, Ms. Samson was a research and teaching assistant in the Department of Civil Engineering. She directed graduate and undergraduate laboratory studies in the design and operation of bench scale ion exchange, dual media filtration, biological wastewater treatment, and sedimentation unit She also directed laboratory studies in the charprocess operations. acterization of water, municipal wastewater, and industrial wastewater. Her research effort at VPI examined a treatment and recovery technique for

Verified for accuracy by: Connie Durst Samson Date: 01-26-89

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a hazardous waste and was presented in a thesis entitled "Removal of Silver and Mercury from COD Waste Solutions."

May 1980 to September 1982: Carbose Corporation

As an independent consultant for a chemical manufacturing plant, Ms. Samson established QA/QC procedures for the company and directed product research and development.

September 1977 to September 1982: Energy Center Incorporated

Ms. Samson managed laboratory operations for characterizing and testing water, wastewater, soils, and coal. For Energy Center Incorporated, she also assisted with mine reclamation studies and conducted acid mine drainage treatability studies.

October 1975 to November 1976: University of Pittsburgh

As a full-time undergraduate student at the University of Pittsburgh, Ms. Samson participated on an EPA research grant to evaluate the performance of a three-stage, aerated lagoon, municipal wastewater treatment system. She conducted water quality and hydraulic parameter monitoring and analyses. The evaluation resulted in recommendations for system operational improvements.

#### PROFESSIONAL LICENSES AND MEMBERSHIPS

Virginia Engineer-In-Training Certification Water Pollution Control Federation Member American Water Works Association Member

#### AWARDS AND HONORS

Tau Beta Pi Engineering Honor Society Phi Kappa Phi National Honor Society

## **PUBLICATIONS**

Wetzel, R.S., D.H. Davidson, and C.M. Durst. 1987. Effectiveness of In Situ Biological Treatment of Contaminated Groundwater and Soils at Kelly Air Force Base, Texas. Proceedings of the Oak Ridge Model Conference. The Department of Energy Oak Ridge Operations, Oak Ridge, Tennessee, October 13-16, 1987.

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Wetzel, R.S., D.H. Davidson, C.M. Durst, and D.J. Sarno. Field Demonstration of In Situ Biological Treatment of Contaminated Groundwater and Soils. Proceedings of the 12th Annual Research Symposium on Land Disposal, Remedial Action, Incineration, and Treatment of Hazardous Waste. USEPA Hazardous Waste Engineering Research Laboratory, Cincinnati, Ohio, April 21-23, 1986.

Durst, C.M. 1986. Removal of Silver and Mercury from COD Waste Solutions. Department of Civil Engineering, Virginia Polytechnic Institute and State University.

Wetzel, R.S., C.M. Durst, D.J. Sarno, P.A. Spooner, S.C. James, and Demonstration of In Situ Biological Degradation of E. Heyse. 1985. Contaminated Groundwater and Soils. Proceedings of the 6th National Conference on Management of Uncontrolled Hazardous Waste Sites. Hazardous Materials Control Research Institute, Washington, D.C., November 4-6, 1985.

Durst, C.M., and W.R. Knocke. 1985. Removal of Silver from COD Waste Solutions. Proceedings of the 17th Mid-Atlantic Industrial Waste Conference. Lehigh University, June 23-25, 1985.

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DERRAL D. VANWINKLE

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# **EDUCATION**

San Diego State University, B.S. Geology with emphasis in geophysics (1986)

# SUMMARY OF EXPERIENCE

Mr. VanWinkle is a geophysist/geologist with SAIC's Environmental Technology Group. Mr. VanWinkle's experience in hazardous waste site investigations includes: site operations manager, geophysical survey investigations and data reduction and evaluation and collection of geologic and hydrologic data.

# **EMPLOYMENT HISTORY**

Mr. VanWinkle is currently acting as the field supervisor at the Parson's Casket Hardware Remedial Investigation/Feasibility Study (RI/FS) for the Illinois EPA (IEPA). He is responsible for oversight of all drilling operations, sample collection, sample management, (using CLP protocols), and on-site health and safety.

Mr. VanWinkle has served as the site operations manager for the Peterson AFB RI/FS Stage 1. He was responsible for overseeing all preliminary site investigations such as soil-gas and geophysical surveys, and interpretation of preliminary surveys to develop drilling and sampling programs. He was also responsible for all drilling operations; sampling and sample management, on-site hydrologic and geologic data collection and interpretation; on-site health an safety; on-site client relations; and final report preparation for the Peterson AFB RI/FS Stage 1.

Mr. VanWinkle has served as the project geophysicist on the Dover AFB RI/FS and the Peterson AFB RI/FS responsible for data collection, data reduction and interpretation, and final report preparation of data.

Mr. VanWinkle helped with the final report presentation and data interpretation of geophysical data collected during the Stringfellow RI/FS in Riverside, CA. He was also involved as a rig geologist in overseeing drilling operations; collection and interpretation of geologic samples; sample management and sample transfer, well installation and development; groundwater sampling; in-situ field measurements; low-volume and high-volume air sampling; and data compilation and interpretation.

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# DERRAL D. VANWINKLE

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Mr. VanWinkle has served as a rig geologist overseeing drilling operations; collection and interpretation of geologic samples; hydrologic data collection and interpretation, in-situ field measurements; sample collections management, and transfer; well installation and development; data compilation and interpretation; and final report preparation for several Air Force Base Installation and Restoration Programs (IRP) including: George AFB, Eielson AFB, Lowry AFB, and Dover AFB.

Mr. VanWinkle has also served as a project scientist for the CSDOC (County Sanitation Districts of Orange County) 301(h) ocean monitoring program. included duties sediment, water, and tissue-sampling with added responsibilities of determining proper sampling depths from in-situ measurements of outfall plumes, sample storage and transfer, and data base management and compilation.

Mr. VanWinkle served as an assistant inorganic chemist at SAIC's La Jolla His responsibilities included analysis of samples by atomic absorption and colormetric methods, and determination of physical parameters such as total suspended solids, total dissolved solids, alkalinity, soil pH and specific conductance. He was also responsible for data reduction, quality assurance/quality control (QA/QC), and final report presentation.

# AWARDS AND MEMBERSHIPS

Certified for OSHA requirement of 40 hours training in hazardous waste operations (NUS Corp.) Associate Member of the Society of Exploration Geophysicists (SEG) Member of the Southern California Environmental Chemists Society Member National Water Well Association (NWWA)

# ARTICLES, PRESENTATIONS, PUBLICATIONS AND REPORTS

Senior Thesis (1986): An Interpretation of Six Geophysical Techniques to Produce a Geologic Picture of the Eastern Espanola Basin. Presentation to the Association of North Bay Scientists (1980): An analysis of Common Bottled Waters.

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## FREDERIC A. ZAFRAN

## **EDUCATION**

Drexel University, M.S., Environmental Science (1979)
Michigan State University, B.S. Zoology (1973)
Temple University, Additional graduate studies in Biochemistry and Physiology (1973)

#### SUMMARY OF EXPERIENCE

Mr. Zafran is a Senior Environmental Scientist and Project Manager with 12 years professional experience in environmental and health sciences. His primary expertise is the assessment of impacts of toxic substances and hazardous waste on environmental and biological systems. Mr. Zafran is the principal scientist at SAIC responsible for conducting public health risk assessments of hazardous waste sites and facilities. He has experience in conducting these evaluations at Superfund sites, RCRA facilities, DOD and DOE waste sites, and laboratory and industrial facilities. Mr. Zafran's background encompasses work in toxicology, environmental chemistry, ecology, and computer science as well as environmental planning and management. He has a working knowledge of key environmental legislation including CERCLA/SARA, RCRA, CWA, SDWA, and TSCA, and has assisted in regulatory review of Federal and state programs.

#### **EXPERIENCE**

1979 - Present: Science Applications International Corporation (SAIC)

Mr. Zafran has been involved extensively in hazardous waste site evaluation and has experience in all phases of the Remedial Investigation/Feasibility Study (RI/FS) process including: (1) preliminary assessment, site investigation (PA/SI) and HRS scoring; (2) identification and examination of potentially applicable or relevant and appropriate requirements (ARAR); (3) baseline public health risk assessment (RI); (4) risk assessment in support of the evaluation and selection of remedial alternatives (FS); (5) derivation of action (i.e., target cleanup) levels for contaminants in all environmental media and (6) risk communication to government officials, private sector clients, and the general public.

Mr. Zafran is currently providing senior technical support to EPA in public health and environmental risk analysis on the Agency's Technical Enforcement Support (TES) contract. He is presently evaluating the human health and biota Endangerment Assessments prepared for the Rocky Mountain Arsenal Offpost Operable Unit (Denver, Colorado), and is contributing to the Feasibility Study for the CPS/Madison NPL site located in the State of New Jersey. In addition

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to this work, Mr. Zafran is conducting or contributing to risk assessments for the following sites and facilities:

- DOD Facilities/Air National Guard Bases: Buckley ANGB, Dover AFB, Eielson AFB, Hill AFB, Joe Foss Field ANGB, Lowry AFB, McEntire ANGB, Niagara AFB, and Peterson AFB.
- Stringfellow Hazardous Waste disposal site (NPL site).
- Commercial RCRA facility in the midwest United States.

Mr. Zafran recently completed the preliminary development of a computer-based methodology for derivation of risk-based target cleanup levels for radionuclides and nonradioactive contaminants in soils and groundwater. This work was conducted in support of remediation efforts at a mixed waste site at the DOE Idaho National Engineering Laboratory. An integrated, modular spreadsheet design was used to link exposure assumptions, toxicity measures, target risk levels and remediation goals. The design of the software affords maximum flexibility to conduct sensitivity analysis, and to balance compliance with ARARs and overall protection, with the need to select a technically feasible, cost-effective remedial alternative.

Mr. Zafran is also providing assistance to DOE and E.I. du Pont de Nemours at the Savannah River Plant (SRP) in Aiken, S.C. He recently prepared a technical briefing paper reviewing and evaluating methods for risk assessment of short-term exposure to nonradioactive carcinogens that may be of potential concern at SRP. Mr. Zafran was SAIC/ETG Project Manager on the same contract for du Pont and DOE, providing support in evaluating the extent of waste site contamination at SRP, and in identifying and selecting remedial action alternatives. He was responsible for the following assessments: (1) selection of indicator contaminants for 26 waste sites; (2) development and application of methods for characterizing long-term risks to human health for nonradioactive contaminants; (3) methods development for public health risk assessment (acute toxicity) of transportation and waste site closure accidents; and (4) review of transport models for ecosystem impact assessment.

Also for DOE, Mr. Zafran conducted preliminary evaluations for dozens of waste sites at the Hanford DOE Facility in Washington state. The objective of these assessments was to identify sites that required corrective action under RCRA or remediation under CERCLA.

Mr. Zafran has provided senior technical support in risk assessment on numerous other projects. These include:

Assistance to the EPA Office of Air Quality Planning and Standards. Mr. Zafran provided expert review of protocols for public health risk assessment of emissions from aluminum smelting.

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- Expert review of risk assessments prepared by other contractors, that were developed to support selection of RCRA facility corrective actions.
- An assessment of potential long- and short-term risks to human health of release of chemicals from the proposed EPA Full Containment Hazardous Waste Research Facility in Cincinnati, Ohio. Mr. Zafran designed the risk assessment study, and evaluated hypothetical impacts associated with day-to-day operations at the laboratory, as well as catastrophic release scenarios (i.e., explosion).
- Assistance to the Chemical Manufacturers Association in developing an Air Toxics Information Manual for member industries. Mr. Zafran provided guidance in use of air transport modeling and in evaluating potential impacts to human health of long-term, low-level release of chemicals form industrial facilities.
- Support to the EPA Office of Policy Analysis in evaluating the comparative risks to human health of sources of ground-water contamination.
- Assistance to the EPA Office of Toxic Substances in evaluating testing need for priority substances designated under section 110 of SARA (ATSDR Toxicological Profiles).

Mr. Zafran was Project Manager on two multi-year task-order contracts for EPA Headquarters. Mr. Zafran and a team of scientists supported the EPA Carcinogen Assessment Group in conducting toxicological evaluations, quantitative risk assessments, and pharmacokinetic modeling of carcinogenic compounds and their metabolites. For the EPA Office of Drinking Water, Mr. Zafran and his staff developed national occurrence and exposure estimates of chemicals in public drinking water systems. This work supports EPA ODW in the development of drinking water MCLs.

Mr. Zafran managed two Work Assignments for the EPA Region V Great Lakes National Program Office. He was responsible for the preparation of Remedial Action Plans for Deer Lake and Torch Lake in Michigan. In these two assignments, SAIC evaluated environmental conditions in the river and lake systems and developed a systematic and comprehensive approach to restoring beneficial uses. Also for EPA Region V, Mr. Zafran assisted in the development of a water quality management plan for the Grand Calumet River/Indiana Harbor Canal. He conducted a critical evaluation of the state's water quality criteria and standards program, developed a method for evaluating the existing sediment contamination problem, and used this method to identify and rank sediment contaminants of concern to aquatic life and human health.

Mr. Zafran has assisted the EPA Office of Solid Waste (OSW) in reviewing applications submitted by industry for RCRA Part B permits. He has reviewed

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numerous delisting petitions for exclusion of waste generated at apecific facilities, from listing under RCRA a hazardous waste. Also for OSW, Mr. Zafran assisted in evaluating the Vertical Horizontal Spread (VHS) ground-water transport model proposed by EPA for use in predicting levels of contaminants at receptor wells. In addition to evaluating the appropriateness of the model for its intended use, Mr. Zafran proposed a method for estimating concentration of organic compounds in leachate from land-farmed waste, or waste disposed in landfills. The approach involved predicting the equilibrium partitioning of contaminants between aqueous and solid phases of soil-water systems.

As Work Assignment Manager on the Water Quality Based Program Contract for the EPA Office of Water Regulations and Standards, Mr. Zafran was responsible for: (1) developing hazard assessments (aquatic ecological effects and mammalian/human health effects) for 20 nonpriority pollutants found to be incompatible with the workings of POTWs; and (2) preparing a background and review document on methods for the derivation of sediment criteria and their application under CWA, MPRSA, RCRA, and CERCLA. Mr. Zafran was also technical contributor to an Environmental Impact Statement on the disposal of coal ash in the waters of the New York Bight. He evaluated the toxic impact to marine species associated with direct exposure to waste ash or contaminants released therefrom, and the potential for effects on human health and welfare.

Mr. Zafran conducted a study of the impact of coal liquefaction and shale oil products on aquatic systems. This work for the Office of Toxic Substances involved the assessment of the toxicity of compounds characteristic of synfuels that are responsible for major environmental effects: polycyclic aromatic hydrocarbons, polynuclear heterocyclic and aromatic bases, water soluble aliphatic and aromatic hydrocarbons, and trace metals.

Mr. Zafran contributed to the development of a field guide for EPA and the Coast Guard, on responding to the spill of sinking chemicals in aquatic systems. On this effort, Mr. Zafran outlined methods for characterizing discharged materials, the extent of contaminant transport, the potential for environmental impacts, the need for emergency response, and identifying response objectives.

For the EPA Office of Analysis and Evaluation, Mr. Zafran conducted a study of environmental quality problems of the Narragansett Bay estuary. This included the physical/chemical characterization of the estuarine system, and examination of uses of the Bay and an evaluation of water quality problems, wetland loss, and shoreline erosion. Also for this office, Mr. Zafran assisted in developing a five-year estuarine quality and protection program plan. He identified and evaluated research needs in the following six areas: estuarine characterization site-specific criteria development, use attainability analyses, wasteload allocation techniques, monitoring, and benefit-cost assessment.

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Mr. Zafran was Work Assignment Manager on a project for the EPA Office of Federal Activities to assess the extent to which the 404 Program assesses and supports research essential to the protection of sensitive aquatic resources. Analysis of existing research and future needs facilitated the development of a broad-based program plan for 404-related research activities.

Mr. Zafran conducted a preliminary study of the impacts of incineration of sewage sludge on human health and the environment. Specifically, he provided the EPA Sludge Task Force with an assessment of contaminants likely to be emitted to the atmosphere, a quantification of emissions factors, and an identification of pollutants of major concern. For the Office of Technology Assessment, Mr. Zafran prepared a comparative overview of ocean disposal of sewage sludge and disposal in terrestrial environments.

Mr. Zafran has contributed to the development of regulatory support documents for Toxic Substances Control Act Section 4, priority chemicals (OPTS). He was responsible for the analysis of information on pollutant emission, environmental transport, and transformation as it relates to occupational and general population exposures. Also for OPTS, Mr. Zafran has prepared numerous Chemical Hazard Information Profiles, providing background health and exposure data in support of risk assessment and test rules development processes.

1974 to 1976: Krusen Center for Biomedical Research and Engineering

Prior to working for SAIC and before returning to graduate school, Mr. Zafran was employed by the Krusen Center for Biomedical Research and Engineering. At the Krusen Center, Mr. Zafran was a research assistant involved in the study of neuromuscular function in human locomotion. While in graduate school, Mr. Zafran worked as consultant (health systems planner) to the Pennsylvania Department of Health, representing the Drexel University Environmental Studies Institute.

PROFESSIONAL AFFILIATION

Society for Risk Analysis

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